

The National Locksmith®

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CODES:
New GM Series cont'd.
pages 85-92

August 1994
Volume 65, No.8



KEYS & KEY MACHINES

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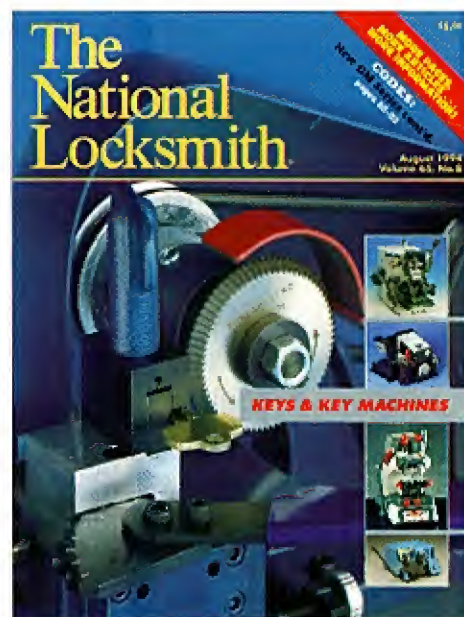
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On The Cover

The key machines featured on this month's cover are Framon Mfg. Co., Inc., and (from top to bottom) DM, HRC, Inc., and Silca K.

**Click on the article
you wish to read**

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COMMENTARY

***More publicity for the locksmith,
Let The Buyer Beware! and...
Join the NSO today***

Boy, is the public interested in crime and how they can be safer! This is no surprise to us as locksmiths. After all, almost everyday we see the devastating after effects of crime first hand.

As you know, I have been doing a lot of radio interviews on the topic of crime prevention. This has given me the opportunity to tell the locksmith's story to the public. You are the professional best positioned to educate and protect the citizen from crime against his or her home and property.

And I have been overwhelmed at the level of interest from local media all over the United States. They very much need people to get on the air and talk about some of the simple ways people can make themselves safer.

That brings me to an idea for you to use in marketing yourself and your business. Just about every local community, even small ones, have a radio station in town. Why not call the program director at your local station to introduce yourself as an anti-crime specialist?

Offer to come in and do some free public service announcements on ways listeners can protect themselves, their families, their cars, etc. Or, better, tell them you would be happy to come in and be a guest on a talk program to talk about the many ways in which folks can make their homes safer from crime.

Hey guys, if I can do this...it can't be rocket science! So start calling your local radio stations today. You may be surprised at how well you will be received. After all, these guys have many hours of programming to fill up and you can help them do a service for the community which you both serve. Do not forget to give the name, address and phone number of your business while on the air. Most radio hosts will not object to this at all. They are grateful that you have spent some of your time with them. Give it a try and let me know what happens!



Marc Goldberg
Editor/Publisher

Now here is a warning I want to give you. There is a company based in Florida called Standard Tool & Lock Co. They are marketing a set of try out keys for \$199.95, and unfortunately they are using our name as a reference. They have been claiming that we endorse their product or that we have written a favorable article about it.

The big problem is that we have never heard of this company and we have never seen their product, nor have we ever written about it. The company has been using a telemarketing effort to make sales to locksmiths.

So if you should get a call from them claiming that *The National Locksmith* is endorsing their product, do not be fooled. Ask the representative to mail you a copy of the article. You will find that the company I refer to cannot mail you a copy...because no such article was ever published.

This kind of business practice is highly unethical. And ordinarily we would be inclined to simply ignore a company making questionable claims over the phone. However, in this case they are abusing our name. So we wanted you to hear it from us first. If they can't show you the article, don't believe them! Stick with the tryout keys offered by the legitimate companies which have, indeed, been written up here. We have been in touch with the Attorney General of Florida and are now pursuing a complaint against this firm.

This month, you may have noticed that your copy of *The National Locksmith* was bound into a cover wrap explaining the benefits of the National Safeman's Organization (NSO). Please give serious consideration to joining the NSO and letting us help you improve your skills in safework and service.

The benefits of the NSO are very numerous and the cost is quite low compared to the profits you stand to earn. So join today!

Marc Goldberg

LETTERS

Comments, Suggestions and Criticisms

The National Locksmith is interested in your view. We do reserve the right to edit for clarity and length. Please address your comments, praise, or criticism to Editor, **The National Locksmith**, 1533 Burgundy Parkway, Streamwood, IL 60107. All letters to the editor must be signed.

Rather Manipulate Than Drill

Dear Marc:

As a regular reader of your magazine, I am very discouraged by those portions of Dave McOmie's safe articles where he disparages the art of manipulation and those who practice it. As the editor, I would expect that you would know better. There is something wrong about resorting to name-calling, especially in reference to one of the highest skills in locksmithing.

I am a busy man, but this doesn't mean that I would drill a lock that takes me ten minutes to pick. A true safeman is not one who just drills. A true safeman is one who sells, services, cleans, repairs, changes combos, drills and manipulates. Dave: Education is the key. Do yourself a favor — learn to manipulate.

John Farkas, CRL
Michigan

P.S. Sorry.... I won't be reading Dave's column anymore.

Dear John:

We couldn't agree with you more. But before you write Dave off, listen to his response to your letter.

Editor

Dear John:

My comments in the April 1994 issue were in reference to an opening executed by two-time World Champion Manipulator, Phil Shearer. Phil was facing a 4-wheel, gear-driven lock, and

I said that "rather than mess around tidily-winking with manipulation or any other such sissified hobby, he approached the job like a real man would with a good drill point and first-rate equipment." That comment was tongue in-cheek, but it is also true.

John, it is a safe bet that you haven't been reading my articles for very long, otherwise you would have written long ago. You see, I have been poking fun at diehard manipulators for years, causing much consternation and calamity with my caustic, comedic comments. But I never intended to offend anyone. Scouts honor! When I call manipulation a "sissified hobby" I am trying to provoke a chuckle, not raise your blood pressure.

I couldn't really be serious, given that I was once a diehard manipulator myself. But the romance is gone. I no longer experience the rush of adrenaline when a safe door swings open. I no longer practice manipulation for hours on end while eating, while watching TV, or while going to the bathroom. (Yes it's true — I had mounted locks everywhere, even on the back of the toilet!) I used to consider myself a manipulating magician, but now I am more of a drill point scientist, committed to raising the skill level in our industry.

I am also trying to learn time-management skills. Since manipulation has lost its seductive charm for me, it comes down to dollars and sense: I will not spend hours trying to manipulate a lock that I can drill open in a few minutes. However, if the romance is still there for you, by all means manipulate your heart out. It is one of the few rites of passage that is really fun, and I wouldn't want to deny you or anyone else the pleasure of becoming proficient at every safecracker's favorite hobby.

Dave McOmie

P.S.: But don't stop reading my articles, lest you be deprived of another important — and fun — rite of passage. No safecracker can truly claim to have paid his dues until he has drilled Relsom, Maxalloy, and read my articles for at least three years. After three years, you will either be well on your way to being a master safecracker or halfway to the Cuckoo's Nest. If the former, congratulations and welcome aboard; if the latter, be sure and tell McMurphy "hi" for me.

Reader Finds Consumer Reports Deceptive

Dear Marc,

I am writing to you regarding the May 1994 issue of Consumer Reports in which their front cover boldly states how to protect your home.

In the thirty years that I have been in the industry, this is without a doubt, one of the most misleading articles I have ever seen regarding mechanical locking devices.

Also enclosed is a copy of a letter I have sent to them which I'm sure will go to no avail.

I strongly feel, as an industry, if nothing is done, articles such as this will continue to be published which are misleading to the general public.

Bob Roy
President Don Jo Mfg., Inc.
Massachusetts

Licensing For More Taxes

Dear Marc:

There are several groups wanting a "locksmith" license. All have the right to voice their ideas.

The politicians are happy to hear from any group that will help them introduce taxes or laws to further harass the working man. This legislation is usually named in a way that makes it go down easier for the people that don't read the fine print. An example is the legislation your magazine reported of in Illinois, under that always politically correct idea "crime control."

Then we have the alarm industry losing sleep over the small one man lockshop installing a battery in an exit device. These guys seem to have a lot of politicians in their pockets though, and can get a lot of nonsense passed as law.

Still another group figures a license will guarantee the public honest and ethical work practices. Neither do they understand how a man wearing overalls can offer quality work to the consumer.

To back this up you get a certificate saying "I am a real locksmith," which of course eases the mind of a burger slinging

employee who just paid a days salary to someone wearing dress pants.

Another group figures a license will prevent a police officer from ever opening a car again. I agree that the police should be doing police stuff, as they are on public pay. But in the end they do what they want anyway.

All these rocks I have thrown were small, not fatal, so don't send hate mail please.

A license is a tax, no more, no less. And once we start paying taxes, we always get asked for more.

Ron Ryder
Nevada

Tips Submitter Responds

Dear Marc:

I have received several phone calls, from other locksmiths, inquiring as to why, when I send in

a tricks articles, I send it in to all of the trade publications that I subscribe to.

My answer to all of them is that many locksmiths do not have the resources to join more than one association or publication. So, it makes sense to send it in to all, hoping it will reach those of us that do not belong to multiple associations.

Over the years, I have sent in quite a few hints, some good, some not so good. Each time, I hoped that I could save some locksmith a few precious minutes, so he could get on to the next job, or get in out of the weather.

I enjoy reading every publication that I subscribe to, and pass them on to other locksmiths in my area that cannot afford them. So, keep up the good work all of you Editor's and here's looking forward to your next issue.

William B. Newns Sr.
Pennsylvania



medeco[®]
HIGH SECURITY LOCKS

**Integrity. Ingenuity....
security solutions.**

[Click here for more information](#)

NEWSMAKERS

New Products and Industry News

CCTV/Access Control Handbook

The 1994 Arius CCTV/Access Control Handbook is a technical and sales guide to hundreds of products by the industry's leading manufacturers. The 116-page guide contains dozens of cross-reference charts, making specifications simple. Dealers who know the features they require in a system can find a variety of product options in the CCTV/Access Control Handbook.

In addition to products, the Handbook also features useful articles on topics like covert surveillance, whole-house video, telephone transmission, intercoms and much more.



Locksmiths can obtain the 1994 CCTV/Access Control Handbook, free of charge, at any local Arius branch or by calling 1-800-388-8668, ext. 6-3217.

For FREE Information
Circle 202 on Rapid Reply

Security Professional Council Promotes Locksmith With Free Home Security Check Up

The Security Professional Council today announced a program for the industry's locksmiths to offer Free



Home Security Check-Ups to consumers nationwide beginning in October.

The program, funded by the Associated Locksmiths of America (ALOA) and the National Locksmith Suppliers Association (NLSA), requests participating locksmiths to commit their time and expertise to conduct thorough, Free Home Security Check-Ups upon request for residents of their communities.

With the current national focus on crime prevention, locksmiths have a tremendous opportunity to take advantage of the program to promote themselves as valued security professionals and reestablish their role as the primary source for security products and services.

In conjunction with National Crime Prevention Month, participating

locksmiths will offer Free Home Security Check-Ups to consumers nationwide. The Check-Ups will focus on locks and door hardware and include exterior and interior inspections of residential properties.

To raise consumer awareness of the program through national and local television, radio and newspaper interviews, the SPC has retained J.J. Bittenbinder, the nation's foremost crime prevention spokesperson to promote the program and offer a toll-free number which consumers can call to receive names of participating locksmiths.

For more information on how you can participate in this opportunity to grow your business, circle the reply number below.

For FREE Information
Circle 203 on Rapid Reply

Key-Z Control Software

Key-Z key control software is designed to be marketed by locksmiths as a powerful, yet low cost, key control system. When bidding keyed systems you can add Key-Z at a reasonable cost or no cost, depending on job size.



Adding key control software to a bid demonstrates that your company is on the cutting edge of new technology and that you genuinely care about your customers key system. And, Key-Z is easy to use too! IBM compatible with available demo and sales brochure, Key-Z is sure to increase your profits.

For FREE Information
Circle 204 on Rapid Reply

Schlage's Flair Design

The Schlage Lock Company is introducing the latest addition to its family of S-Series keyed levers – the Flair – now for order entry. The smooth, upswept lines of the Flair design make it an elegant choice for upscale homes and multi-family dwellings, offices and retail stores.



As with its companion designs in the S-Series, the Flair is appropriate for all residential and light -to- medium duty commercial uses where durability, price, style and accessibility are priorities.

The design compatibility of the S-Series allows specifiers to mix and match facilities with the Schlage family of handicap-approved products. The Flair design, for example, is also

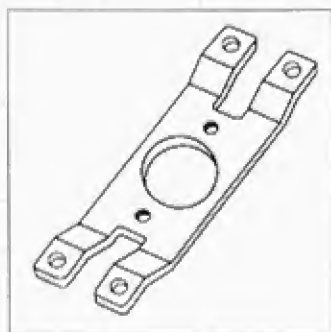
Continued on page 14

Continued from page 12
compatible with products in
Schlage's F-Series and H-
Series and is fully compliant
with the Americans with
Disabilities Act.

For **FREE** Information
Circle 205 on Rapid Reply

LMB-01 Lock Mounting Bracket By Major Mfg.

Major Manufacturing has
designed a new style of



mounting bracket to help
make installations of
cylindrical locks and

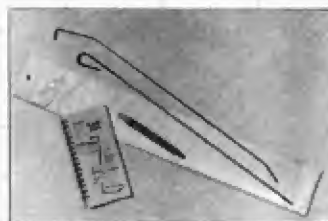
deadbolts in hollow metal
doors faster and more
accurate. The LMB-01 is
stamped from 12 gauge cold
rolled steel for strength,
mounted with pop rivets for
convenience, and supplied
with an adhesive template for
accuracy. The latch mounting
holes are tapped 8-32 to use
the screws supplied with the
lock by manufacturer. The
LMB-01 bracket is also cut
out in the center to allow
installations on metal doors
with a center seam. The
template is marked for 1" and
1-1/8" face plate cutouts as
well as for bracket mountings
holes and center lines to
locate the cross bore and the
center line of door. The LMB-
01 is supplied complete with
template and steel pop rivets.

For **FREE** Information
Circle 206 on Rapid Reply

Z-Tool System's '94 Mini Update Set

Research for the new '94,
6th Edition, Mini Update Set

is completed and ready for
release to current owners of
the Master Z-Tool System®.
The 1994 Mini Update Set
includes: 1994 System



Manual, stainless "Frameless
Window Tool," and one free
Flex-a-Wedge.

To properly update your
existing Z-tool System, it is
best to contact customer
service with your most recent
manual in hand. This will
make for a much more
accurate evaluation of your
existing tool set's needs. We
have only had to add three
tools in five years, so you
couldn't be too far behind.

For **FREE** Information
Circle 207 on Rapid Reply

National Cabinet Lock Office Furniture Locks

National Cabinet Lock has
a wide selection of bolt and
cam locks for use with office
furniture. Lock configurations
available include locks for left
- or right-hand doors
(including handle locks for
lockers), front - or frame-
mount drawer locks, side-
mounted gang locks of
multiple drawers in pedestals
or cabinets, file cabinet locks,
surface-mount lid locks and
plunger bolt sliding door



NATIONAL

AUTO LOCK SERVICE, INC.

**National Auto Lock Service, Inc. offers a wide
range of equipment and services for the
Automotive Locksmith. From tools and hard to
find key blanks to transponder
programming, we can take the mystery out of car
service. We accept credit card orders, and can ship
COD. Contact us for the latest in
automotive technology.**

www.laserkey.com

locks. A removable core feature is also available in some products.

The National Cabinet Lock product line includes pin tumbler, disc tumbler and lever tumbler locks. Many of the most popular locks are included in the Stock Locks ready-to-ship inventory program. National Lock also offers custom lock design services where existing designs will not apply.

For FREE Information
Circle 208 on Rapid Reply

Gardall Six Pack Rack

Gardall Safe Corporation is pleased to announce the re-introduction of its popular Six Pack Rack promotion. The rack contains six popular Gardall models including both fire and burglary safes.



The rack is an excellent way to improve safe promotion in your store while using little floor space. Your customers will be able to gain hands-on experience with the safe while comparing the features contained in each model.

For FREE Information
Circle 209 on Rapid Reply

AMSEC's New Burglary/Fire Safes

AMSEC's new "BF" series safes lets you take advantage of an age old problem, offering the industry's first affordable solution when



Burglary and Fire protection are an essential part of your customers buying decision. The BF series is offered in three different sizes. The two smaller sizes carry a UL Listed 1 hour fire label and the larger size carries a 1/2 hour UL listed fire label. All models are B-rate heavy duty construction.

For FREE Information
Circle 210 on Rapid Reply

Medeco Bag Product By RA-Lock Company

RA-Lock Company has developed a bag product for Medeco Cam and Switch Locks. Boxed 10 per box, keyed alike or keyed different, the cam locks come in standard sizes of 5/8", 7/8", 1-1/8", 1-1/2". The switch locks come keyed alike or keyed different, single pole, double throw, maintained, key pull in on and off position.

Each bag includes all parts and instructions for installation.

A factory center for Medeco Lock Company, RA-Lock Company feels that the time has come to offer a high security product to the customer that demands a little more than the standard cam or switch lock.

For FREE Information
Circle 211 on Rapid Reply

Gil-Ray Tools Now Sharpens Hole Saws And Drill Bits

Gil-Ray Tools Inc. best known for their mail in sharpening service for dull

key cutting wheels has recently added precision drill bit sharpening and hole saw sharpening to their growing list of services for the professional locksmith.

Gil-Ray can sharpen High Speed Steel drills through 1" diameter and Hole Saws



through 6" diameter. They also offer sharpening for all Multi-Spur Bits and Auger bits as used with the Schlage installation kits.

For FREE Information
Circle 212 on Rapid Reply

Door Systems, Inc. New Super Heavy Duty Keylex™

The first super heavy duty mechanical, keyless access control in North America is the Keylex K-100 series from Door Systems, Inc.

Super Heavy Duty with a two-year limited warranty, solid cast brass body with all



metal components and a unique, patented, resettable "break-away" slip clutch lever handle mechanism.

Standard features include: field reversible lever handles, 2-3/8" or 2-3/4" commercial 5/8" throw deadlatch and a passage feature (easily de-activated).

High security key bypass model available. Retrofits into existing heavy duty door preps of other manufacturers.

For FREE Information
Circle 213 on Rapid Reply

Save Money Eliminate Parking Tickets

Avoid the hassle and expense of parking tickets with the brand new "Ticket Buster" key chain parking timer. It is a compact and attractive device that you will be pleased to present to your customers.

Simply set the timer when you park. The "Ticket Buster" will warn you ten minutes and five minutes before the meter expires and sound the alarm



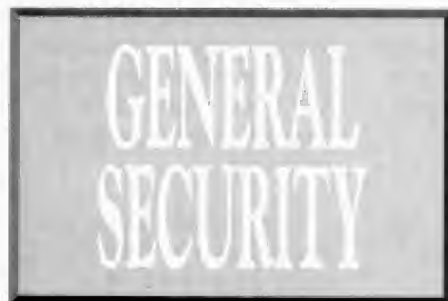
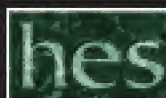
when time is up. You'll never forget or misjudge the time on the meter again.

A great impulse item the "Ticket Buster" comes in an attractive blister display package ideal for a counter rack. It's a fast seller and terrific as an advertising specialty with your company name and logo printed on the back.

Programmable up to twenty hours, ideal for multiple uses such as cooking, exercising, sun bathing, traveling alarm, taking medicine, appointment reminder, and many more.

For FREE Information
Circle 214 on Rapid Reply





THE SCHLAGE D SERIES KNOBSET

Test Article #58

by Giles Kalvelage

How many locksmiths watch a movie and attempt to impress their friends with the information of the lock brand on the door of the movie set? Or how about walking into a shopping mall and identifying the keyways of the store locks to their uninterested companions?

Likewise, one skimming through the pictures of this article may think that we are running previously printed articles from *The National Locksmith*. That is because the Schlage A and D series locksets have a very similar outward appearance. It's probably easier to tell the difference between a Schlage "C" keyway and Kwikset keyway than determine the grade of the Schlage lockset mounted on the door as viewed from the outside of the door from even a short distance.

The Schlage D Series lockset is designed for heavy duty commercial and industrial applications. It is a Grade 1 lockset, and although similar in external appearance to its Grade 2 counterpart, few parts are interchangeable. The D Series lockset is much heavier than the A Series locksets, its knobs more impact resistant, its deadlatch is larger and stronger, and the roses of the D Series locksets hold the lockset to the door without the use of mounting screws. The D Series lockset is available in a number of functions. (See Table 1 on page 17.)

After identifying the lockset as a Schlage from the faceplate of the deadlatch, the easiest way to determine the series of the Schlage lockset is from the

inside rose. The D Series Grade 1 lockset has a smooth rose with only a small hole on the side of the spindle in which to insert a spanner wrench for removal. The A Series Grade 2 lockset has a smooth inside rose cover with a spring catch retainer. Finally, the F Series Grade 3 lockset has two exposed mounting screws on the rose.



2. Set the knob for the proper door thickness using the indicator marks on the side of the anchor beneath the slide housing.



3. Place the knob into the crossbore, making sure the latch and chassis are properly connected.

Lock Installation

Place the latch or deadlatch into the edgebore and secure with the two mounting screws.

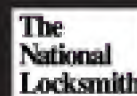
Remove the inside trim of the lockset by placing the point of the spanner wrench into the hole of the knob sleeve on the side of the knob facing the latch retractor. Depress the knob catch and pull the knob off of the spindle. Unscrew the inside rose.

Adjust the outside rose to match the thickness of the door. There are indicator marks on the anchor beneath the slide housing. (See photograph 2.) The anchor ratchets for positive positioning. It is sometimes easier to adjust the outside rose if pressure is relieved from the anchor with your fingers while turning the rose.

Install the chassis and outside knob into the crossbore. Make sure that the housing engages the prongs on the latch and the retractor engages the latch bar. (See photograph 3.)

Attach the inside trim by rotating the inside rose clockwise over the spindle. Start by hand, then tighten with the spanner wrench. (See photograph 4.)

Install the inner knob by lining up the lug in the knob shank with the slot in the spindle. Depress the knob catch and slide the knob on the spindle. Check to assure proper fastening.



SCHLAGE D SERIES LOCKSET FUNCTIONS

| | |
|----------------|---|
| D10S | Passage Latch - Both knobs unlocked. |
| D25D | Exit Lock - inside knob unlocked, blank plate outside. |
| D30D | Patio Lock - inside push button locks outside, unlocked by closing door, or turning inside knob. |
| D40S | Bath/Bedroom Privacy Lock - outside locked by inside push-button, unlocked by closing door, turning inside knob or by small flat blade screwdriver in outside knob. |
| D44S | Hospital Privacy Lock - outside locked by inside push-button, unlocked by turning inside knob, closing door or by turning emergency turn button on outside knob. |
| D53PD | Entrance Lock - Pushing and turning inside button locks outside knob, button must be manually turned and inside knob turned to unlock outside knob. Pushing inside knob without turning, locks outside knob, turning inside knob or using key on outside knob will unlock the lock. Entrance from locked outside knob by key. |
| D60PD | Vestibule Lock - inside knob always unlocked, but outside knob is locked by key from inside. When outside knob is locked by key from inside, entry gained only by key from outside. |
| D66PD | Store Lock - key in either knob will lock or unlock both knobs. |
| D70PD | Classroom Lock - outside knob is locked or unlocked by key from outside. Inside always unlocked. |
| D72PD | Communicating Lock - key in either knob will lock or unlock its own knob. |
| D73PD | Corridor Lock - Locked or unlocked by key from outside knob, inside push-button also locks outside knob. Turning inside knob or closing door releases inside push-button. |
| D76PD | Classroom Hold-back Lock - Outside knob locked or unlocked by key. Inside knob always free. Latch may be held in open position by key. |
| D80PD | Storeroom Lock - Outside knob always fixed, inside knob always free. Entry by key only. |
| D80PDEL | Electrically Locked - Auxiliary latch deadlocks latchbolt when door closed, outside knob continuously locked electrically until unlocked by key, switch or power failure. Inside knob always free. |
| D80PDEU | Electrically Unlocked - Auxiliary latch deadlocks latchbolt when door is closed. Outside knob continuously locked until unlocked by key or electric current. Inside knob always free. |
| D82PD | Institution Lock - Both knobs always locked. Entrance by key in either knob. |
| D85PD | Hotel/Motel Lock - Outside knob locked, entrance by key only. Inside Push-button activates visual occupancy indicator and shuts out all keys but emergency master key. |
| D170 | Single Dummy Trim - used as door pull or to match active hardware on inactive leaf. |

The first letter in each of the above function series is D, referring to the series of the lock, the S refers to spring latch, if a second D appears, it refers to deadlatch.

This lockset generally is mounted into a door with a 2-3/4" backset, although 2-3/8" and 3-3/4" backset latches and 5" extensions are available. The latch mechanism is mounted into a 1" diameter edge bore. The crossbore is 2-1/8" in diameter.

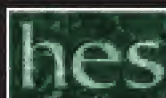
Table 1: Function Table

To remove outside knob (for cylinder servicing or for proper handing), insert an operating key, turn 90 degrees, depress the knob catch with the tip of a spanner wrench or probe type object, and pull the knob off of the spindle.

To replace the outside knob, partially insert the key in the keyway. Assure that the cuts of the key are facing upward. Slide the knob onto the spindle until it stops against the knob catch. Fully insert the key into the cylinder. Turn the key 90 degrees, depress the knob catch and slide the

knob the rest of the way onto the spindle. Return the key to the vertical position. Check to assure the knob is fastened to the spindle.

Removal of the lockset is the reverse of installation.



4. Attach the inside rose.

| NUMBER | PART # | DESCRIPTION |
|--------|----------|----------------------|
| 1 | 04-001 | Outside Rose |
| 2 | 04-002 | Inside Rose |
| 4 | 04-007 | Open Knob |
| 9 | 04-023 | I/S Plunger Unit |
| 13 | 23-001 | Cylinder |
| 23 | C102-522 | Hub & Cap Out |
| 24 | C102-524 | Hub & Cap Ins |
| 31 | C102-840 | Cam & Plug |
| 33 | C203-374 | Spindle & Catch |
| 43 | C203-916 | Spindle & Catch |
| 45 | C303-009 | Slide & Rollers |
| 47 | C503-008 | Cotter Pin |
| 48 | C503-019 | Spring, Slide |
| 49 | C503-308 | Spring, Anchor |
| 50 | C503-314 | Seat, Slide Spring |
| 52 | C503-316 | Catch, Slide |
| 70 | C603-500 | Housing, Slide |
| 71 | C603-501 | Anchor |
| 77 | G505-747 | Spring, Catch, Slide |

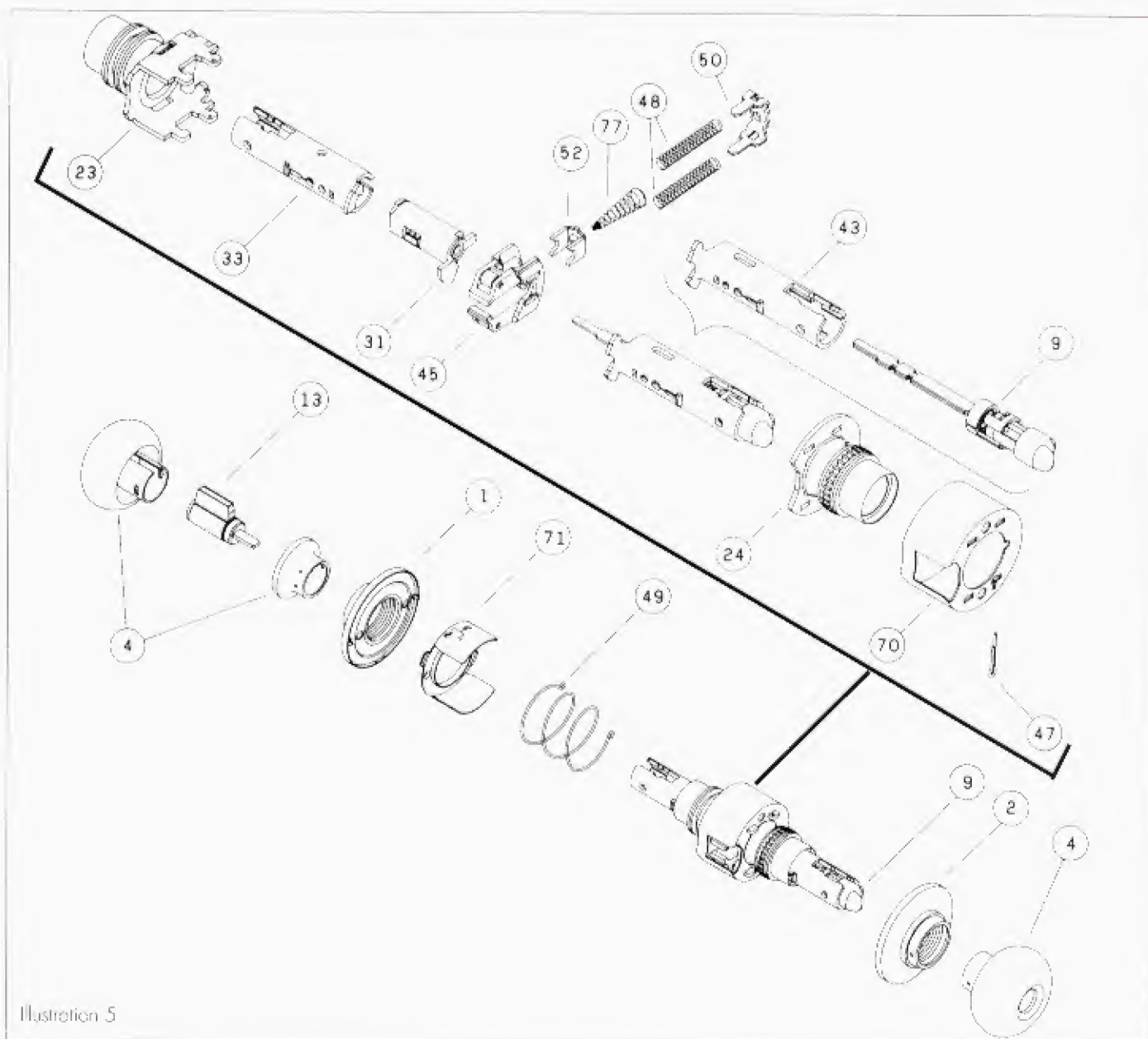
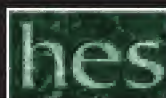


Illustration 5



Continued from page 18

Disassembly for Servicing

The D Series Lockset is durable and rarely requires service except for an occasional tightening of the inside rose, rekeying the cylinder, or lubricating the inside mechanisms after long intervals. In most cases the cost of a new lockset warrants the making repairs. The most common reasons for complete disassembly are to lubricate the interior portions of the spindle and catches, cam and plug, slide and rollers, to replace broken or weak springs, or to remove the exterior knob when a key is not available.

Servicing

See illustration five on page 18 for an exploded view and parts list of this knob.

1. Remove the lockset from the door by releasing the inside knob catch with the point of the spanner wrench and sliding the knob off of the spindle. Using the spanner wrench, unscrew the inside rose from the spindle. Slide the lockset out of the door.

2. Remove the cotter key that holds the Outside Hub and Cap to the Slide Housing.

3. Slide the Slide Housing outward over the Spindle and Catch. It may be easier to remove if the Slide and Rollers is depressed with your thumb while removing. (See photograph 6.)

4. Use caution on this next step to avoid "flying springs." With your thumb gently pressing on the Slide and Rollers, push slightly downward on the Inside Hub and Cap to disengage the tabs of the Outside Hub and Cap. The Spindle and Catch and I/S Plunger Unit will then release outward. This is the time to be careful with the Slide and Rollers because the springs underneath them have a tendency to fly. (See photograph 7.)

5. To remove the Spindle and Catch from the Inside Hub and Cap, depress the catch and slide the Hub and Cap off of the spindle.

6. Should it be necessary to remove the I/S Plunger Unit from the Spindle and Catch, gently pry the tongue of the Plunger Unit down with a screwdriver and slide the unit out of the spindle. (See photograph 8.)

7. The springs should disengage themselves from the Slide & Rollers. If not, a gentle tug removes them. (See photograph 9.) Notice there are three springs which return the slide.

8. The Slide and Rollers may also disengage themselves from the Outside Hub and Cap, if not, it will lift out now. Should it be necessary to remove the Slide Spring Seat, twist it to a 90 degree angle and lift off.

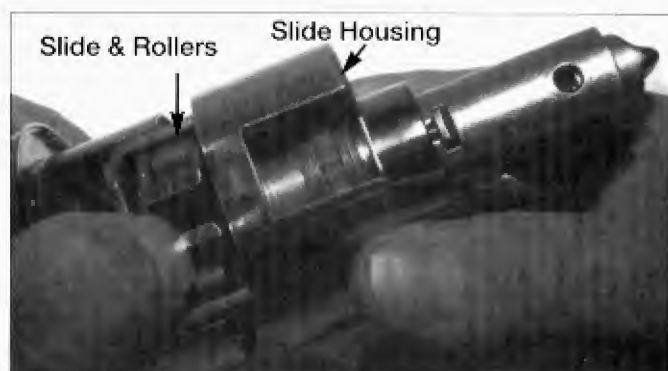
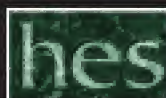
9. The Cam and Plug will now lift out. (See photograph 10.) NOTE: At this point, the back of the lock cylinder is partially exposed from the inside of the Spindle and Catch. The catch restricts much of the view of the back of the lock cylinder compared to the A Series Lockset (see *The National Locksmith*, July 1993, Schlage A Series Tear down) but the cap pin can be depressed and the cylinder's bar and driver rotated to allow the catch to be depressed if no key is available to turn the cylinder.

10. Remove the outside knob by rotating the cylinder 90 degrees with a key, picking or using the method described above.



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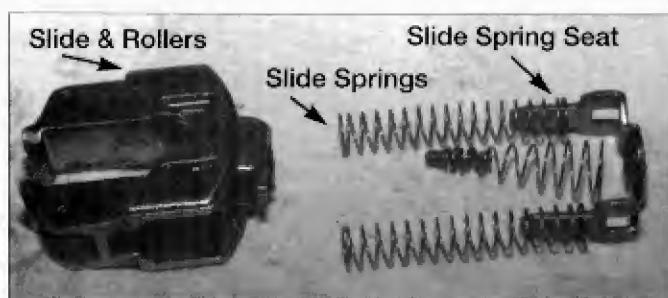
6. Removing the Slide Housing from the chassis.



7. Holding in on the Slide and Rollers to prevent springs from flying.



8. Removing the I/S Plunger from the spindle.



9. From the left is the Slide and Rollers, Slide Springs and the Slide Spring Seat.

11. Remove the Outside Rose by unscrewing it from the spindle. The Anchor Spring and the Anchor will slide off. (See photograph 11.)

12. Remove the Spindle & Catch from the outside Hub & Cap by depressing the catch and sliding the spindle through the Hub & Cap.

Reassembly is the reverse of disassembly.

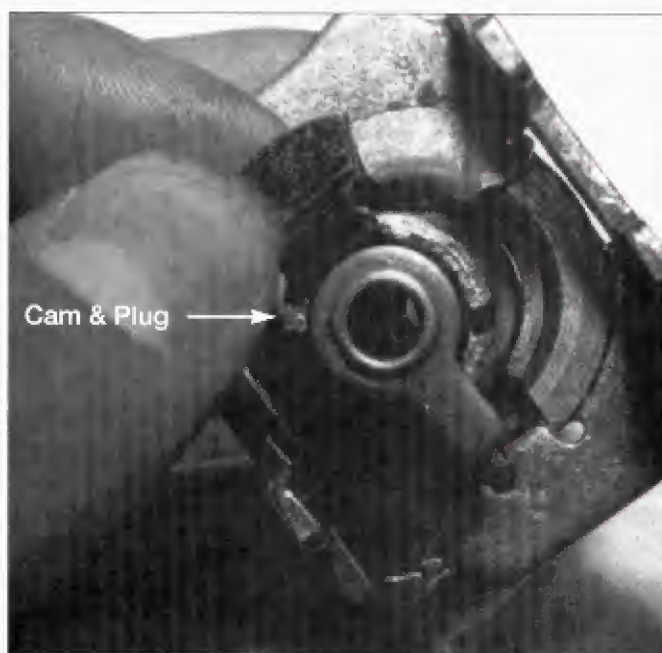
Cylinder Servicing

The cylinder is serviced in the same fashion as the A Series cylinder. In fact, the D Series cylinder is interchangeable with the A Series cylinder with the exception that the bar and driver is shorter.

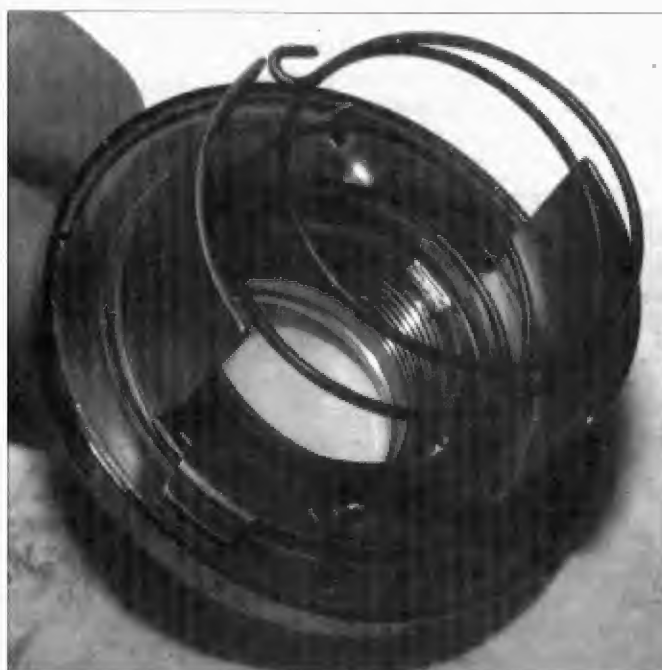
The keyway is sectional. The standard keyway is the "C" keyway. If no other keyway is specified when ordering the lockset, this is the keyway which will probably be provided. Like the A Series, the

second most common keyway is the "E" keyway. The "CE," "EF," "F," "FG," "G" and some numbered keyways are less common, but may be encountered on D series locksets. Additionally, Primus cylinders and interchangeable core cylinders may be used in D series locksets.

Spacing and depth specifications are identical to the A series as well.



10. Once the Cam and Plug are removed, access can be made to the back of the lock cylinder.



11. The Anchor Spring and Anchor can be removed.



AUTOMOTIVE SECURITY

FORD 10-CUT FINALE

Test Article #59

by Tom Mazzone

Not content in keeping the newly developed 10-cut system the same, Ford initiated various changes starting with the 1991 Ford Escort and Mercury Tracer. In these models, the first three spaces are not used in any of the vehicles' locks. Positions four through nine are incorporated into the door locks as well as the deck lid cylinder. The ignition utilizes positions four through ten. This means that once the door or deck lid biting is determined position ten can be progressed to get a working key for the ignition.

For vehicles incorporating this new system, it is unnecessary to cut positions one through three onto a key. For aesthetic purposes, however, any depth can be made in these positions provided the MACS of two is not violated. Overall, this change is very locksmith friendly for generating a first key.

Apparently not satisfied with the changes of 1991, along comes 1992 and another change to the Escort/Tracer 10-cut system. Again the first three spaces are not used for the door lock portion. Yet, unlike its most recent predecessor, the door lock now incorporates tumblers in only five instead of six positions. (See Table 1 for a synopsis of the Ford 10-cut systems.)

In this new series lock, the depths for positions four through eight are known through the door or deck lid lock, leaving us to find the depths for positions nine and ten for the ignition. While creating a larger number of possibilities than its immediate predecessor, the number of possible tries needed to progression the last two cuts of this key is still greatly reduced from the

original 10-cut system. In fact, once the depths for positions four through eight are determined, use Table 2 to create a first key.

In 1993, the Ford and Nissan created the Ford Villager and the Nissan Quest in a joint venture. These vehicles use the 10-cut system introduced in the 1992 Escort/Tracer. The door locks utilize tumblers in positions four through eight. The ignition has tumblers for positions four through ten. Unlike the Escort/Tracer, however, the Villager/Quest also

have a glove box lock that includes tumblers for positions eight and ten.

Making a key for these two vehicles is simple. The depths for positions four through eight come from the door. Position ten can be obtained by progression through the glove box. Position nine is obtained by progression through the ignition.

If desired, try out keys are also an effective method to determine a first key. They are used in the same manner as in the past but you will

FORD 10-CUT TUMBLER POSITION GUIDE

STANDARD 84-1/2 FORD 10-CUT SYSTEM

| Position | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----------|---|---|---|---|---|---|---|---|---|----|
| Door | X | X | X | X | X | X | | | | |
| Ignition | | | | | X | X | X | X | X | X |
| Trunk: | Std. 5 Pin Ford System Using Secondary Blank. | | | | | | | | | |

1991 FORD ESCORT/MERCURY TRACER

| Position | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----------|---|---|---|---|---|---|---|---|---|----|
| Door | | | | X | X | X | X | X | X | |
| Ignition | | | | X | X | X | X | X | X | X |
| Deck Lid | | | | X | X | X | X | X | X | |

1992 FORD ESCORT/MERCURY TRACER

| Position | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----------|---|---|---|---|---|---|---|---|---|----|
| Door | | | | X | X | X | X | X | | |
| Ignition | | | | X | X | X | X | X | X | X |
| Deck Lid | | | | X | X | X | X | X | | |

1991 FORD ESCORT/MERCURY TRACER

| Position | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-----------|---|---|---|---|---|---|---|---|---|----|
| Door | | | | X | X | X | X | X | X | |
| Ignition | | | | X | X | X | X | X | X | X |
| Glove Box | | | | | | | | X | | X |

Table 1

**1992 FORD ESCORT/MERCURY
TRACER PROGRESSION CHART**

*If space 8 is a 1 depth cut spaces 9
and 10 to the following:*

| Key #1 | Key #2 | Key #3 | Key #4 |
|--------|--------|--------|--------|
| 1-1 | 2-1 | 3-1 | |
| 1-2 | 2-4 | 3-2 | |
| 1-3 | 3-5 | | |
| 2-3 | | | |
| 3-3 | | | |
| 3-4 | | | |

*If space 8 is a 2 depth cut spaces 9
and 10 to the following:*

| Key #1 | Key #2 | Key #3 | Key #4 |
|--------|--------|--------|--------|
| 1-1 | 3-1 | 4-2 | |
| 1-2 | 3-2 | 4-3 | |
| 1-3 | 3-3 | 4-5 | |
| 2-1 | 3-5 | | |
| 2-2 | | | |
| 2-3 | | | |
| 2-4 | | | |
| 3-4 | | | |
| 4-4 | | | |

*If space 8 is a 3 depth cut spaces 9
and 10 to the following:*

| Key #1 | Key #2 | Key #3 | Key #4 |
|--------|--------|--------|--------|
| 1-1 | 2-1 | 3-1 | 4-2 |
| 1-2 | 2-2 | 3-2 | |
| 1-3 | 2-3 | 3-5 | |
| 2-3 | 2-4 | | |
| 3-3 | 3-4 | | |
| 4-3 | 4-4 | | |
| 5-3 | 4-5 | | |
| 5-4 | | | |
| 5-5 | | | |

*If space 8 is a 4 depth cut spaces 9
and 10 to the following:*

| Key #1 | Key #2 | Key #3 | Key #4 |
|--------|--------|--------|--------|
| 2-1 | 3-1 | 4-2 | |
| 2-2 | 3-2 | 4-4 | |
| 2-3 | 3-3 | | |
| 2-4 | 4-3 | | |
| 3-4 | 5-3 | | |
| 3-5 | 5-4 | | |
| 4-5 | | | |
| 5-5 | | | |

*If space 8 is a 5 depth cut spaces 9
and 10 to the following:*

| Key #1 | Key #2 | Key #3 | Key #4 |
|--------|--------|--------|--------|
| 3-1 | 4-2 | 5-3 | |
| 3-2 | 4-3 | | |
| 3-3 | 4-4 | | |
| 3-4 | 5-4 | | |
| 3-5 | | | |
| 4-5 | | | |
| 5-5 | | | |

Table 2

find that fewer try out keys are needed. Once the correct tryout key has been determined, it is simply a matter of decoding the two remaining positions from half cuts to true depths.

While all this may sound confusing, the new generation 10-cut systems are actually simpler to work on in comparison to the original. The vehicles currently affected by the new 10-cut systems are the Ford Escort and Explorer, Mercury Tracer and Villager, and the Nissan Quest.

While not common, there may be some decoding problems that should be pointed out. There have been reports of Ford substituting a 5 depth wafer in place of a 4 depth wafer. While this substitution still allows the door lock to operate, the ignition lock is of tighter tolerance and may not work.

If a true 4 depth is mistaken for a 5 depth, the ignition will not turn. In this event, suspect that all 5 depths may actually be 4 depths. Cut all 5 depths to a 4 depth and file to a 4-1/2 depth. Run your progression sequences again and look for impression marks once the lock has yielded.

If you see an impression mark on a 4-1/2 depth, file that space to a 5 depth. If no mark is visible, recut the key using 4 depths in those positions. Using the MACS factor also helps cut down some of the work.

As you can see, the change in the system while intimidating at first, is actually easier to work with than the original setup. While Ford's reason for revision is unclear to this author, once again we see that changes in the lock systems may be dealt with by obtaining as much information as possible. In this case, one can agree that once there is a good working knowledge of the original Ford 10-cut system, these new procedures can be quickly adapted.



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ELECTRONIC SECURITY

CORRECT CONNECTIONS

Test Article #60

Sometime while running wire or cable it is going to be necessary to splice or terminate the wire. Splicing is the joining of two sections or loops of wire to form a larger or longer loop or branches within a loop. Terminating is connecting the end of a loop to a designated device(s) or to the terminal strip of a control panel. Whether splicing or terminating, it is important that the connections be made properly. Incorrect or poor execution of either is both unprofessional and dangerous.

Some examples of problems caused by incorrect splicing and termination:

A recent service call involving this writer revealed some incorrect wiring connections performed by a "professional" and "licensed" alarm service. The problem involved the intermittent and unreliable operation

of an exterior mounted phone intercom/entry system.

After checking the general operation of the system, the control panel was opened and inspected for water leakage, wire corrosion, damage caused by rodents or insects, etc. Visual inspection revealed little. The unit was dry and all wiring looked in fine shape. Next we began the tedious process of inspecting each line, starting with the power input connections (lines from the transformers that powered the unit and the connected electric strike).

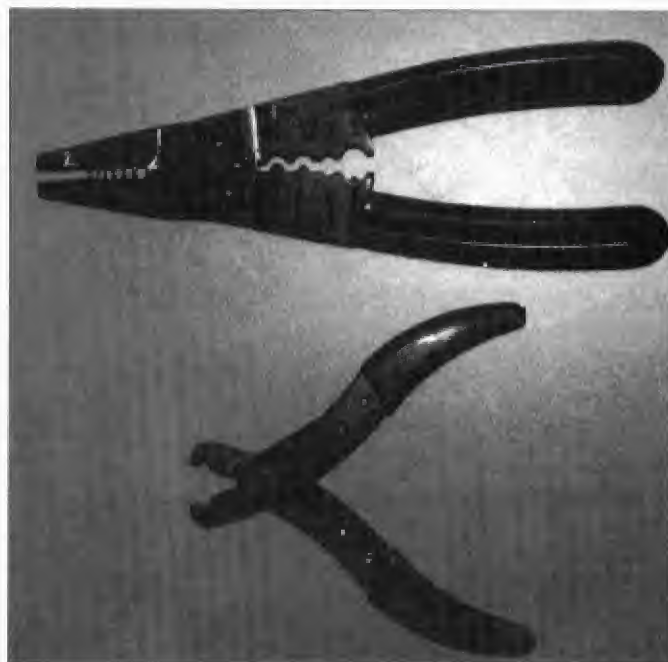
A Volt-Ohm-Meter (VOM) revealed an inconsistency with the input power. The power requirement of the unit was 12VAC and the power requirement of the strike was 24VDC. The input reading for both, however showed a reading of 52VDC and 36VAC. Interesting, to say the least.

Carefully following the power loops we found several splices and connections. All connections were made by twisting the wire together and wrapping them with a single piece of electrical tape. Also found was a splice where both the power supply to the unit (12VAC) and the electric strike (24VDC) were tied together.

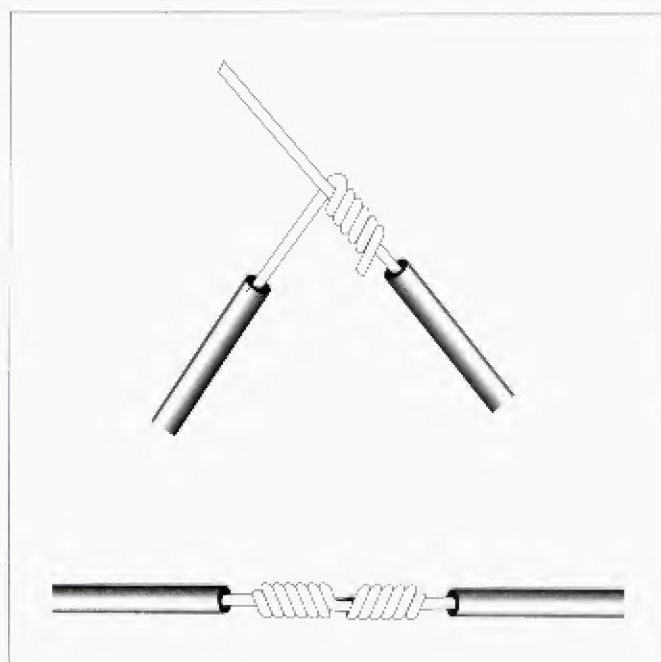
Further inspection of other lines revealed bare (the tape had fallen off) and unraveled splices and connections; the result of incorrect and dangerous splicing.

A second example involved a commercial customer complaining about constant false alarms from their alarm. So frequent was the problem, that they refused to use the alarm anymore.

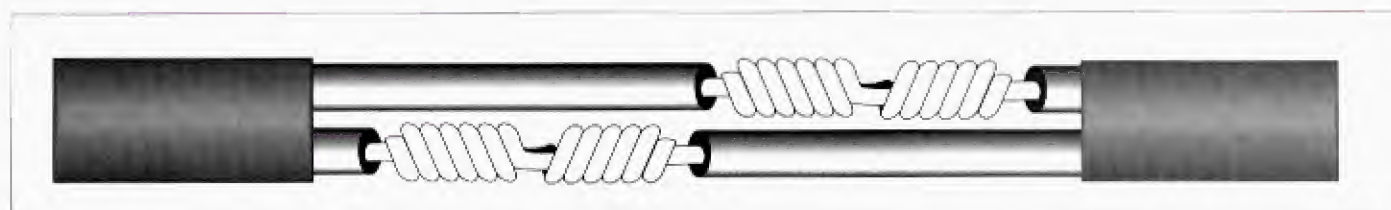
As expected, their problem was caused by a "swinger." A swinger is



1. This simple wire stripper can make the difference between professionally executed work and poor workmanship.



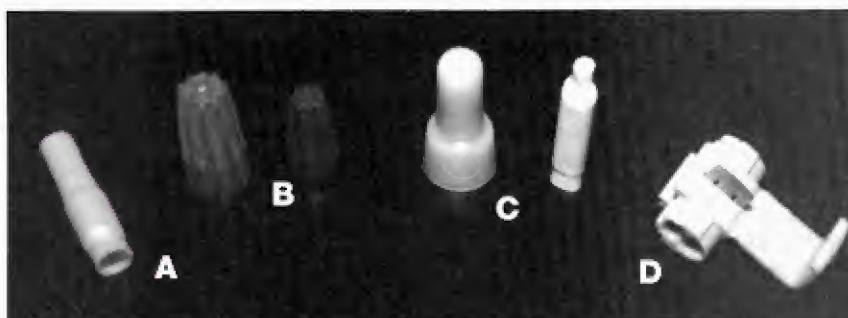
2. This Western Union splice is just one of many that can be used on solid wire.



4. Staggered splicing allows spliced conductors to be pulled more easily

Rattail Joint

Probably one of the most common splices for both solid and stranded wire is the Rattail Joint. This splice simply involves the twisting of two or more conductors together to give the rattail effect. (See illustration 3.) After twisting, use a crimp connector, cap connector or solder and tape to complete.

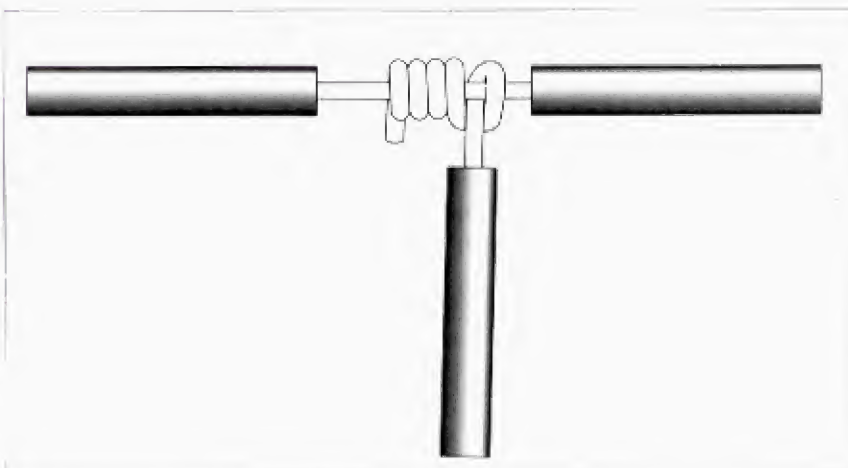


5. Common connectors include the butt (A), the wire nut (B), the cap (C), or the tap (D) connectors

The cap connector is like the wire nut except that it is crimped instead of screwed onto the wires. Coming in various styles, the crimp connector is placed over a rattail joint splice and crimped to hold the wires in place. This connector can be used on either solid or stranded wire.

Staggered Splice

Because wire is often pulled through conduit or has to pass through small holes in walls and metal or wood stud framing, it is critical that splices be kept small. Large bulky splices not only make it hard to pull the wire, but are candidates for becoming damaged and disconnected when passing through a small hole or making a tight bend.



6. This is a sample of a tap splice used on solid wire

Once connectors are in place, complete the splice by taping or using shrink tube. Remember that there are different size and rated connectors. Use the correct connector for the wire size and electrical specifications being worked on.

It's for this reason that the staggered splice be used. This splicing method is especially effective on solid wire conductors having more than two splices at the same point. The idea of this technique is to spread the splicing out over a length of the wire, or staggering each spliced conductor so they are not all balled up in one spot. (See illustration 4.)

For solid wire the Western Union splice makes excellent and compact connections. For stranded wire, soldering or butt connectors make for compact splicing. Tape or use shrink tube after completing the splice.

Connectors

Although there are many types of connectors, the most common include the butt connector, the cap or end connector, and the wire nut. (See photograph 5.) The butt connector is a plastic coated metal tube. The ends of the spliced conductors are inserted into each end of the tube which is then crimped. This type of connector is excellent for joining stranded wire. Solid wire in this type of connector tends to work itself free and is not recommended.

The wire nut is familiar to all of us. It is typically a conical shaped piece of plastic with a threaded interior. After joining wires using a rattail joint, the wire nut is "screwed" over the top of the splice. This connector is good on either stranded or solid wire using a rattail splice.

Butt Vs. Tap

All of the above connections are known as Butted splices. Each splice is made by joining the free ends of the conductors. Another, not so common splice is the tap splice. This splice is used on solid wire where the end of one conductor is spliced into the center of another conductor. Illustration six shows how this splice is made.

Several connectors are now made that allow tap splicing without the need to strip the wiring and are as effective with stranded wire as with solid. These connectors are common in auto alarm installation where a main wire needs to be tapped into for power or sensing.

Next month we will continue our coverage of splicing and terminating.



BEGINNER'S CORNER

Opening Briefcase Combo Locks

Sometimes an ordinary social conversation turns into a job. An acquaintance asked, "Are you a locksmith?" When I answered yes, he asked if I worked with combinations. He explained that he had an expensive briefcase that locked with combinations but had not been able to use it because he could not remember the combination numbers. I told him to drop it off and I would get the numbers for him.



by
Eugene Gentry

This is a nice leather briefcase. (See photograph 1.) I knew I could get the combination numbers because I had worked on one similar to this. On the previous briefcase, a scope was used to look on the left side of the wheels. The shaft could be seen, and when the flat side of the shaft appeared, the wheel was on the correct number.

But this case was different. Each side of the wheels had obstructions, so nothing could be seen with the scope. On the right side was a plastic washer and on the left was a spring. I tried to move the wheels to one side for a better view, but they were too tight.



1. Leather briefcase and the all too familiar combination locks.

The next step was to see if I could feel the indentation in the shaft. I needed some kind of shim for a feeler, and found that the Weiser shim pick was the right thickness. The shim pick was inserted in the top corner of the left side of the first wheel. (See photograph 2.) The wheel was turned and an indentation could be felt at the number 4. The shim was inserted on the left of the second wheel and the number was 7. The third wheel turned up another 7.



2. Decoding the lock.

Due to the fact that the flat spot on the shaft of the previous briefcase was on the top, I thought the combination to be 4-7-7. But it turned out that it was not. Then I remembered a technique used when looking for safe combinations. The safe is drilled and the gates are lined up with a scope, but they are not under the fence. The numbers then have to be transferred until the gates are under the fence.

Using this procedure was easy to do on this briefcase as there are only ten numbers on a wheel. The wheels were rolled forward, testing the latch, on 5-8-8, 6-9-9, etc. until they reached five numbers past the original numbers. The briefcase opened with the numbers 9-2-2. This tells us that the flat part on the shaft would have been on the bottom instead of the top.

To open a combination briefcase, use the scope first. If that does not work, then try the shim. The shim has to be thin to fit by the side the wheel and sturdy to take pressure applied. A Sesamee decoder would work well. This is used to decode a Sesamee combination padlock.



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Cover
Feature

MAKE THE MOST OF YOUR MACHINES

It is important that you keep your key machine in top operating condition. After all, how long can you last without a key machine?

More than any other trade, locksmithing requires a substantial investment in tools and equipment. Proper maintenance of these tools is essential to your business. Without a doubt, your key machine is the most important tool in the shop. Whether you have one machine or twenty, it is important that you keep it in top operating condition. After all, how long can you last without a key machine?



by
Steve Gebbia

Although there are many different types of key machines, they all require the same basic care. (See photograph 1.) There are four aspects to proper maintenance: cleaning, lubrication, cutter care, and minor repairs.

CLEANING

Brass chips should be cleaned from the machine regularly. Areas to be especially concerned with are inside the vise jaws, on and near the motor, and around the power switch. If chips are allowed to accumulate, they can prevent the key from seating in the vise properly, or possibly cause a short circuit and electrical fire.

LUBRICATION

While there are a few newer machines that have sealed motor bearings, the vast majority of machines in use today require periodic lubrication. Locate the oil fill tubes near the motor end bearings and along the cutter shaft. (See photograph 2.) Using a light duty motor oil, apply two or three drops until the oil is just below the top edge of the tube. Run the machine for a few minutes to allow the oil to fully penetrate.

Another area that needs lubrication is the rail along which the vise carriage travels. When this gets dry, it can be

difficult to move the vise carriage. Spray the rail with a light duty penetrating oil (such as WD-40 or Tri-Flow) and then wipe most of it off. If you don't wipe it off, dust and brass shavings stick to it and make it even harder to move.

CUTTER CARE

Even the best quality key machine cutters require periodic adjustment and replacement.

As the cutter wears, the effective diameter decreases. To compensate for this, you must adjust the guide stylus. The alternative is miscut keys.

Adjusting A Duplicating Machine

Adjusting a duplicating machine involves the following:

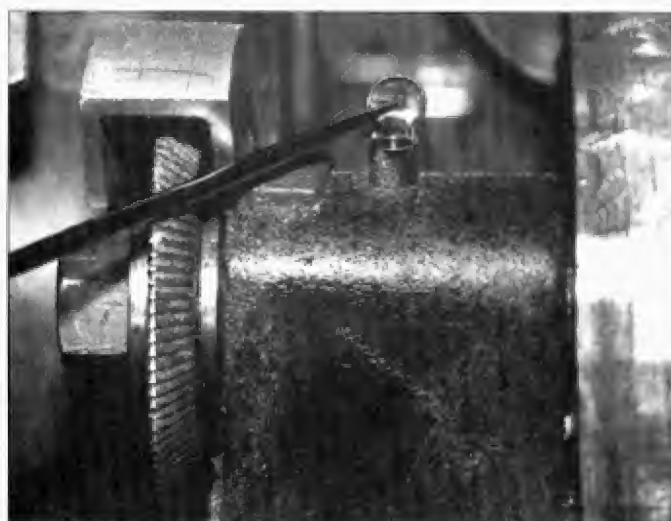
- Obtaining an approximate adjustment
- Fine tuning the adjustment
- Checking the final adjustment

There are several ways to obtain an approximate adjustment.

One method involves the use of an electronic device that indicates when the key just touches the guide. This is done by checking for electrical continuity. When the key contacts the guide, the circuit is complete and an indicator lights. A second light indicates when contact is broken. Adjust the guide to the point where the second light goes out and the first one comes on.



1. This bench full of machines is typical of many lock shops.



2. The oil filler tube on a standard duplicator. Adding lubrication on a regular basis is needed to keep the machine running smoothly and accurately.

Continued on page 30

Continued from page 28

Another method calls for the use of a micrometer to check your adjustment. This calls for trial and error and can be time consuming.

A third method uses two identical key blanks. These are inserted into the vise jaws as though you are going to duplicate one onto the other. The adjustment is fairly close when the cutter just scrapes the finish off the second blank.

A similar method uses a piece of paper on the blade of the second blank. Adjust the guide until the cutter cuts the paper but not the key blank. The result is an adjustment which is accurate enough so that you can start fine-tuning the adjustment.

Adjusting the guide stylus is very similar on most duplicating machines. You will find minor differences on some machines, but, for the most part, the process is the same.

On the top of the casting which holds the guide is an Allen head set screw which prevents the guide from moving once it is adjusted. Below the guide is the adjusting screw. Loosen the set and you can adjust the guide in or out by turning the adjusting screw. (See photograph 3.)

Obtain an approximate adjustment and then tighten down the set screw. Back out the adjusting screw until the oversized head just touches the front of the slot in the guide. Do not force it - you will change your adjustment. The idea is to use the head of the screw to prevent the guide from walking inward.



3. loosening the guide stylus for adjustment.

Once you have an approximate adjustment, duplicate a factory original key and measure both the original and the duplicate to determine how close you are. When the duplicate is within .001" of the original, then duplicate the key to the third generation. Test each key in a good quality cylinder (coded to factory cut keys) as you go.

A first generation key is a duplicate of an original key. Each time a key is made from a duplicate, it is referred to as the next generation. So, that a third generation key is a duplicate of a duplicate (second generation) of a duplicate (first generation).

You can make very fine adjustments by backing out the adjusting screw a little at a time once the set screw is tight. Don't try to go too far - 1/8 of a turn total at most. If you force it past this point you may damage the adjusting screw or the guide.

Continue making fine adjustments until the third generation key works smoothly. Once it does, it should be within .001" of the original. Adjusting your machinery to this precision ensures accurately cut duplicate keys.

Adjusting A Code Machine

Adjusting a code machine is a little different because there is no guide stylus. Both depth and space are adjustable.

Adjusting the spacing on a HPC 1200CM is accomplished by moving the key carriage along the spacing shaft.

First, choose a factory cut key with a deep cut in the third position. Clamp the key in the vise and place the third cut directly in front of the cutter. The cutter should be in line with the center of the cut.

Place the correct code card in the machine. (If you are using a Schlage factory cut key, use the Schlage card.) If the needle is in line with the third cut, the spacing is correct. If it isn't, it needs to be adjusted.

Turn the machine over and loosen the two set screws on the bottom of the key carriage. (See photograph 4.) Lightly tap the side of the carriage, toward the bottom, in the direction you need it to move.

Turn the machine right-side-up and check the spacing again. When the cutter is in line with the center of the third cut and the needle is in line with the third position on the card, your adjustment is correct. Be sure to tighten the set screws.

To check if the depth setting is accurate, cut a key by code with the machine. Then, measure the key with a micrometer.

Adjust the depth by rotating the depth rod inward or outward. There is no need to loosen the set screws on this rod. The rod is eccentric (slightly oval), so that rotating it changes the position it contacts the cutter guide. Rotate it toward you to deepen the cut and away from you to make the cut shallower.

Continued on page 32

Continued from page 30

Replacing The Cutter

As a cutter gets dull, it no longer cuts the brass cleanly. Instead, it pushes through the material and the metal 'rolls' off the side of the blank. It may also sound different as it cuts. These are sure signs that it is time to replace the cutting wheel.

A cutter with a chipped tooth does not necessarily need to be replaced. (See photograph 5.) As long as it cuts cleanly and does not grab the blank it can still be used.

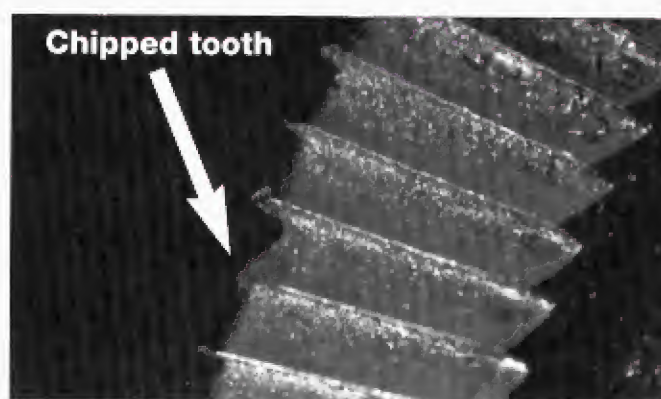
When you replace a cutter on a duplicating or a code machine, you need to re-adjust the machine for the new cutter.

After replacing the cutter, check that the spacing between the guide and the cutting wheel has not changed. The distance from the left side of the guide to the high point on the cutting wheel should equal the distance from shoulder stop to shoulder stop on the key gauge. If it doesn't, you need to use a brass shim alongside the cutter to compensate for this. Otherwise, the spacing will be off if you use the gauge arm to position the key blank.

You may want to consider using resharpened cutters on your machines. They cost less than new cutters and last just as long (sometimes longer). You can have your cutters sharpened or you can buy reconditioned ones.



4. Adjusting the HPC 1200 CM for spacing.



5. Even a cutter with a chipped tooth can still be used.

One of the nicest things about buying reconditioned cutters is that you can buy a matched set. These will be the exact same diameter as each other. This is helpful if you use two different type cutters on the same machine (such as a code machine). When the adjustment is correct for one cutter, it will also be correct for the other.

Only you can decide if reconditioned or resharpened cutters are the right choice for your shop. The condition of your machines, the amount of use they get, and the type of cutters you need will all play a role in your decision.

MINOR REPAIRS

Your machine will need some minor repairs from time to time.

Probably the most common of these is thrust bearing replacement. The thrust bearings are located between the vise handle and the key vise itself. They allow the vise jaws to tighten and release smoothly. If your vise jaws no longer hold a key tightly or the vise handle 'locks up', replace the thrust bearings. They are available from the manufacturer of your machine. Each set consists of two flat washers and a bearing that sits between them.

Another related problem is worn vise jaws. When the vise jaws are worn, they will tilt as they are tightened. This may cause the jaw to grab the blank in one of the wards, making it hard to remove from the vise.

Other less common repairs are: motor, pulley, and drive belt replacement. When replacing any of these items, be sure that the new item is the same size as the old. For a motor, this means that horsepower, RPM, and amperage should all be the same as the original. (Cutting wheels are designed for optimum performance at a specific speed.)

When replacing pulleys, be sure that they are the same diameter as the old. Changing the size of the pulleys changes the speed of the cutter and may adversely affect performance. Check that both the motor pulley and the cutter pulley are directly in line with each other as well.

Maintaining your key machines does not have to be a long involved process. The trick is not to let the work pile up on you. A few minutes a day is all it takes.

Take good care of your machinery and it will pay you back with many years of loyal service.



Cover
Feature

THE KEY AND CUTTER CONNECTION

*Without cutter angle, flat width, and MACS,
screwdrivers would be all the key anyone would need to open most locks.*

by Phil Agius

A customer comes in for a spare key. Clamp the blank in the vise and run it through the duplicator. You've taken away your customer's concern of losing the only key to their new car.

Another walks in with a desk lock which has no key. Look up the number in the code book, cut the key, and you've done what looks like the impossible to your customer.

Your profession as a locksmith puts you into situations like these every day. As you cut keys on your duplicator or code machine, the engineering that went into the machine is probably the last thing on your mind. After the key is in the vise and the brass chips are flying, we all assume the keys we cut should work perfectly, every time.

Factors like cutter angle, flat width, and MACS are usually the last thing from our thoughts. Without these factors, however, we could all close down shop and try our

The distance from the shoulder to the first cut is .231", plus or minus .001". This is known as the "Cuts Start At" or "Starting Cut" position.

In some keying systems, such as the Best A2, A3, and A4, as well as many auto keying systems, the measuring is done from the tip or a tip stop near the tip of the key.

"Spacing" or "Cut-To-Cut" distance is the measurement between cuts, and in most cases is consistent for the entire length of the key. In our example, the spacing from the center of cut 1 to cut 2 is .1562" (.3872" - .231" = .1562"). This Cut-To-Cut distance remains constant for all adjacent cuts. Factory tolerances for the spacing is plus or minus .001".

"Included Angle" is the angle of the cut, measured from the inside slope on one side of the cut to the other slope, and is related to the security level of the key being cut. In our Schlage example, this angle is 100 degrees.

This angle as well as the "Width Of Flat" is dependent on the cutter angle. In most keying systems the Flat is the actual surface of the cut on which the pin rests when the key is inserted in the lock. Both the Included Angle and the Width Of Flat vary from manufacturer to manufacturer, although most are close enough to use the same cutter for several different manufacturers.

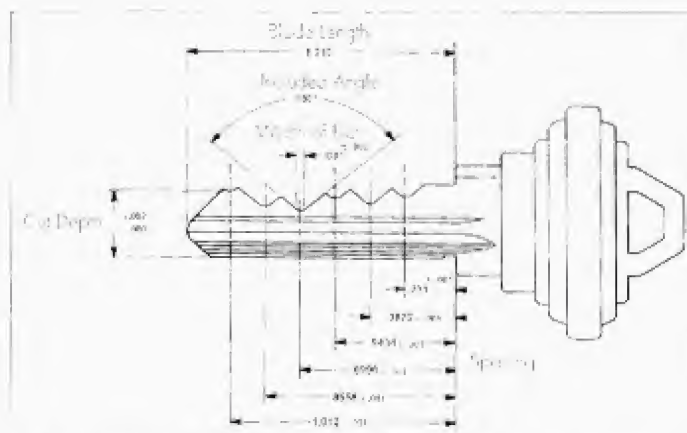
"Cut Depth" or "Root Depth" is the distance from the bottom of the key blade to the root of the cut or flat. Notice that this measurement is not how much key is taken or cut away, but how much metal is left after a cut has been made. In the Schlage example, depths range from a 0 cut (shallowest) to a 9 cut (deepest). Dimension A in illustration one shows that depths can be .002" high and still be acceptable.

Other terms that are commonly used are "Key Bitting" and "Drop." Bitting simply means the cuts on the key. A key bitting of 23654 describes the cut depths from bow to tip. This key has a 2 depth at the bow and a 4 depth at the tip.

Drop is the increment or distance between sequential cut depths. This measurement is extremely important when masterkeying. Schlage uses .015" drop; a 9 cut has a .200" cut depth, a 8 cut has a .215" cut depth, a 7 cut has a .230" cut depth and so on.

The MACS

One of the most important factors in a masterkey system, or anytime a key is being originated, is the Maximum Adjacent Cut Specification (MACS). This describes how deep of a cut can be located next to a shallow cut, and still allow enough flat for a pin to properly seat. Should an

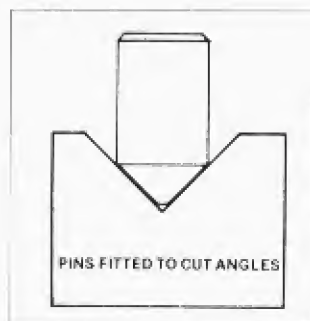


1. Taken for granted, the specifications required for cutting a key are critical not only to the operation of the key and lock, but to the machines that cut and duplicate the keys as well.

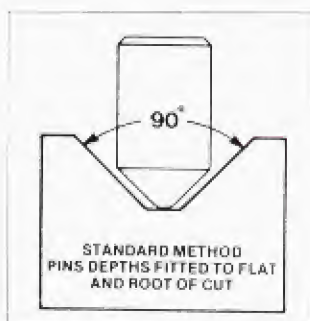
hands at a different profession, as screwdrivers would be all the key anyone would need to open most locks. In the following pages, we'll take a technical look at these issues, how they affect the keys and locks we work on, and how machines are manufactured around them. Let's start by looking at a key itself.

The Basics Of A Key

Illustration one shows a typical Schlage key. In most cases, measurements are taken from the key's shoulder towards the tip. The shoulder provides a consistent reference point on the key from which all measurements can be taken. The overall blade length in this case, measured from the shoulder to the tip, is 1.210".

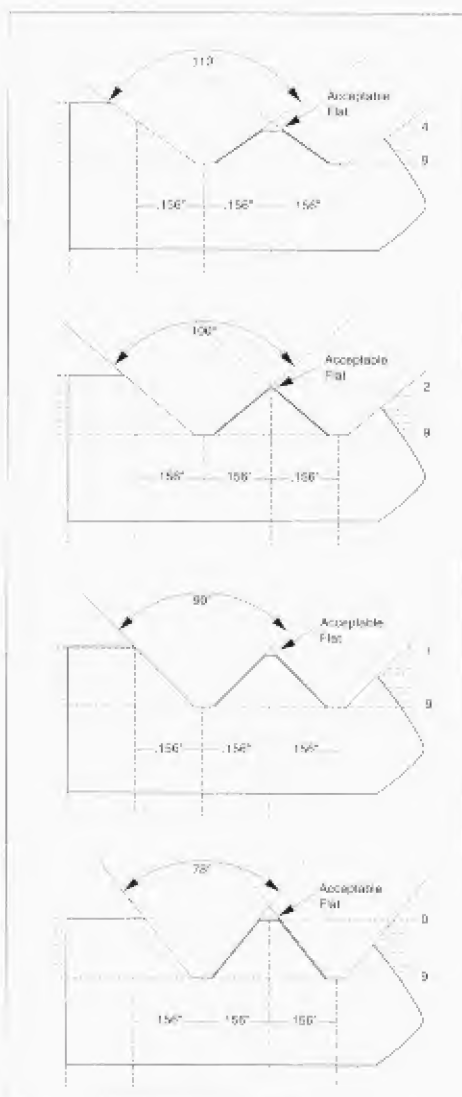


2. The flat on this cut is almost non-existent. Because the angle of the pin rests on angles of the cut, the specifications of both the pin and the cut must be kept within very tight tolerances. This type of cut is typical of Medeco.



3. More common is this type of arrangement. The tip of the pin rests squarely on the flat.

extremely deep cut be adjacent to a very shallow cut, the flat of the shallow cut will be cut away by the deep cut. Staying within the MACS prevents this problem.



4. MACS is determined by the included angle of the cut. Notice how the flat is affected by the varying cut angles shown in this illustration. The smaller the angle, the higher the MACS or safety factor.

must not exceed seven. A key bitting of 34925 is acceptable because the difference between each adjacent cut is seven or less. A key bitting of 34915, however, is not acceptable. The 9 cut next to the 1 cut exceeds the MACS value for this manufacturer's key system ($9 - 1 = 8$).

Effects Of Cutter Angle And Flat On Key Operation

Why does a Schlage key seem to slide into a lock with no effort, and a Sargent key seem stiff? Remember, our Schlage key has a 100 degree included angle. Sargent, however, uses a 78 degree angle. A wider angle allows the pins less resistance to "climbing the wall" or the slope of the angle on the cut of the key. This gives the key the property of entering the lock very smoothly.

Width of flat on a key was described as the surface of the key that the pin rests on. Illustration two and three show different pin seating situations used by some of today's lock manufacturers.

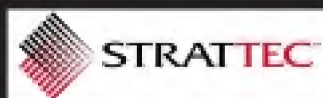
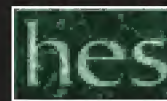
Illustration two shows the seating arrangement utilized by Medeco. Notice how the pin uses very little width of flat. In the case of Medeco, the actual cut depths are theoretical, since the pin never reaches the root of the cut. The pin rests on the sides of the cut itself. Starting cut position and spacing are critical when cutting a key for this type of pin seating, since any deviation from center forces the pin upwards and interferes with the shear line.

The example in illustration three is the most common used today. The pin rests on the actual flat of the cut. The

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angle of the cut is matched closely to the angle of the pin. The flat is wide enough so that a few thousandths deviation in spacing still allows for a smooth operating, properly working key. The cut spacing and depth still must be accurate, but does not require the exactness of the Medeco key.

Effects Of Cutter Angle And Flat On Macs

Probably the most important effect of cutter angle and flat is its impact on the Maximum Adjacent Cut Specification (MACS), or safety factor. Illustration four shows a key with .156" spacing and .015" drop between cuts. In this example we hold the flat on the cut constant at .040" to illustrate the effect of varying the cutter angle.

With a 78 degree cutter angle, the sides of our cut intersect well above the blade of the key. This means that we can cut a 9 depth next to a 0 depth and still have enough flat for the 0 pin to seat properly. The actual surface left for pin seating can be illustrated by joining the two 78 degree angle lines along the 0 depth line. There is no restrictions on adjacent cuts with this system.

With the 90 degree cutter angle, the sides of our cut intersect just under the top blade of the key. This does leave somewhat of a flat on which the pin can seat, but not enough to go without a safety factor. If, in cutting the key, the spacing between cuts is off by just a few thousandths of an inch, our pin will not have a sufficient flat on which to rest. This system needs a MACS of 8 to assure properly operating keys.

The 100 degree cutter intersects close to the 1 depth line. This leaves enough flat along the 2 depth for a proper pin seat. We can use a MACS of 7 with this system and feel safe that the pins will seat properly. Note how the flat at the 0 depth has been completely wiped out by our cutter.

A 110 degree cutter while providing effortless key insertion in the lock, really kills the safety factor. The 110 degree lines intersect just above the 3 depth and leaves no surface for a proper pin seat at that depth. A 4 depth next to a 9 depth, however, allows enough flat for a pin to seat properly. This gives us a MACS of 5.

This same progression can also be duplicated by varying the Width Of Flat instead of the cutter angle. For instance, using a 90 degree cutter and sequentially widening the flat subsequently lowers the safety factor.

Each of today's lock manufacturers have examined all of these factors in designing their cylinders and keys. They have compiled them into what they believe to be the best combination for ease of use, safety, and keying possibilities. As locksmiths we have to understand and utilize these specifications, and guarantee that our customers are receiving quality keys, proper lock rekeying, and accurate masterkey systems.

The author is Sales Director for Framon Manufacturing Co.



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SCHOOLS TO SUCCESS

"A correspondence course. That was my beginning. Today, I am a CML and have built a business that is prospering."

In January 1981 I was having some keys made at a small key cutting shop on the parking lot of Gibson's Discount Store in Amarillo, Texas. The owner was an older man who had worked for Cole Key Company for many years. I asked him how a person could become a locksmith.

"I'm not a locksmith, I'm a key cutter," he replied.

"But how do I become a locksmith?" I asked.

I will never forget his seriousness and his reply. "You really don't want to do that. Those people are about half crazy. If you have both oars in the water, you won't even consider it," was his reply.

I thought long and hard about what he said and in about ten seconds I replied, "Sounds like I would fit in very well."

"Well, you think about this very seriously for a week. If you still think you want to do this, come back and I will have some information for you."

I thought about it for a week and came back. He had information on a correspondence course from Foley Belsaw, which he gave to me. That was my beginning. Today, I am a CML and have built a business that is prospering. The point I am trying to make is that we all need proper training. In this age of electronics there is a tremendous amount to learn and remember.

Larry Bloom had been a professional cabinet maker for thirteen years. His uncle had given him a correspondence course on locksmithing which stirred his interest enough to look into it further. He took a day off from work and visited the campus of Pine Technical College in Pine City, Minnesota. He was impressed enough to quit his job and go back to school.

Larry attended Pine Tech, completed all the necessary requirements in five quarters and graduated in 1991. Upon graduation Larry went to the Denver area and worked for two years. He returned to Bloomington, Minnesota and is now employed by Bloomington Lock & Safe which is a full service security company serving both commercial and residential customers.

His schooling was very strong in the basic skills such as picking, impressioning, key identification, and hands-on lock installation. He is now getting some up-to-date information and classes on electronics, electric strikes, and



by
Don Probasco

magnetic locks. There is one co-worker who is very strong in these areas and Larry works with him at every opportunity, especially when they are involved with the electronic and magnetic locks. He realizes that education sometimes comes in the form of on-the-job training.

One of the things that impressed him about his schooling was the willingness of the instructors to answer questions from the students. There were times when they did not have an answer. They would either find the answer or refer the students to someone who could give them the information they needed.

An advantage I have found to belonging to a local locksmith association is the contacts a person makes with people in different fields on lock selling and servicing. These may be other locksmiths or sales people from wholesale supply houses or lock related manufacturers. One trick that I have personally used is to get a business card from a person and write the date and location where we met. That way I can refer to this information if I have need to call upon the person whose card I have.

Larry uses his knowledge to work in all fields although his safe work is confined primarily to combination changing. His favorite area is the electronic part of the business. He enjoys working on and installing electric strikes, magnetic locks and keyless entry systems. With the rapid changes we are seeing in the electronic area of locksmithing Larry seems to be right on track.

There are a number of fine locksmith schools, both correspondence and resident, in the United States. With the need for education and training, these schools have a lot to offer the locksmith; both beginning and master. If you are interested in furthering your education in locksmithing, don't hesitate to contact one of them and ask for information.

In closing I would like to share an old Arabian proverb that is sometimes attributed to Darius The Persian:

"There are four sorts of men.

He who knows not and knows not that he knows not, he is a fool. Shun him.

He who knows not and knows that he knows not, he is simple. Teach him.

He who knows and knows not that he knows, he is asleep. Wake him.

He who knows and knows that he knows, he is wise. Follow him."



LAYING FOUNDATIONS

With technology moving at an ever increasing pace, education for the locksmith is imperative.

Of all the facets of the locksmith trade, education and training are central to survival. With technology changing the face of our industry at a dizzying pace, it's essential that the locksmith remain informed and up-to-date.

Traditionally, locksmiths have relied on seminars, manuals, trade publications and word of mouth to keep them informed. In the wake of technology's ever increasing gait, however, the need for cohesive and thorough instruction is critical for both rookie and seasoned locksmith alike. Acknowledging the need and moving to give this trade the professional status it deserves, Locksmithing Schools are offering solutions for the serious locksmith.

Choosing a school or program should never be taken lightly. Remember, education is the foundation and cornerstone of who the locksmith is and how he performs. When speaking to school representatives, have ready a list of questions you want answered. Be frank, they are there to meet your learning needs.

In choosing a school several factors come into play: Do I want a resident course or correspondence course, what subjects or topics do I need to take, at what level do the topics need to be, what materials are provided and what do I need to provide, are the payment terms acceptable?

Resident And Correspondence

Locksmith schools and training programs offer either resident or correspondence courses, and in some cases both. Resident courses or schools require the student to attend a classroom or meet at some outside location with an instructor. Correspondence courses are completed by mail. Both have their pros and cons.

Resident courses are generally very strong in hands-on, instructor guided sessions. It is interactive, allowing the student direct access to the teacher, answers to questions and the time to exchange ideas with the teacher and other students.

On the other hand, time and proximity can sometimes be a problem. Check to make sure that your time restraints don't hinder participation. If the school is not easily within driving distance, it may be necessary to locate boarding nearby.

Correspondence courses are generally very strong with regards to time and proximity. Most courses are designed to complete at the pace you desire, the pressure to learn everything now or to attend a class

does not exist. And, because most correspondence is via mail, it is not necessary to be in close proximity to the school.

On the other hand, correspondence courses can lack instant teacher-student interaction. Questions that cannot be answered through the material may necessitate a letter or phone call. Hands-on may be somewhat limited and more structured than available with a resident course. When searching out a correspondence school, make sure they have a strong technical support department.

Types Of Courses

Make sure and check the courses offered at each school. Ask for class



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descriptions and what can be expected from each class. Ask what they expect from you for each class or course. Ask what constitutes passing or failing.

Also, make sure the class or course you are intending to take is neither below nor beyond your current level of training. There's nothing worse than spending money on a class whose subject you already know or one you can't understand. Ask if the courses or classes you wish to take have prerequisites.

Also, when choosing a school, make sure that the subject matter covers those topics where you need growth. Many schools specialize or are strong in certain aspects of locksmithing. Some may be strong at safes or commercial hardware, still others may be strong at electronic security or auto locksmithing.

Granted you can always learn something new on an already known topic, but it's best to leave this type of learning for seminars and manuals. When it comes to school, get the most class for your money.

Materials

Before deciding on a class, course or school, ask the school representative what materials they are supplying and what materials you will need to purchase or use.

For example, if you're planning on attending an electronics course, is a Volt-Ohm-Meter needed? If so, do they supply the meter or do you need to bring one? What about wire strippers or soldering gun or connection crimper? Being prepared before class starts beats the embarrassment of not being prepared in class or the frustration of not completing a lesson plan due to lack of supplies or equipment.

Accreditation And Credentials

Accreditation and credentials are an important aspect of education. Many schools and courses are designed, written and taught by locksmiths. What type of experience do the instructors and/or writers have? Do they hold titles by a known institution such as ALOA, DHI or ASIS?

In some cases the course or class may be accredited by local, state or federal teaching institutions. Some offer CEU's, continuing education units, with each course or class completed.

Talk to friends and colleagues that have taken classes or completed lessons from a school you plan on attending or taking. All of this is important in choosing the right school for you.

Payment

When looking at a school or correspondence course, make sure the payment terms are understood and acceptable. Many schools accept credit cards and still others offer payment plans to fit your need. Don't be afraid to ask.

Finally, remember that the schools exist for your benefit. Don't be afraid to ask questions. Getting answers before you get involved may avoid unnecessary disappointment later. And when you choose a school or course, give it all you've got - you're laying the foundation for your future!



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SCHOOLS

Acme School Of Locksmithing

11350 S. Harlem Ave.
Worth, IL 60482
312-361-3750
Resident only
Course Descriptions: Intermediate masterkeying, aluminum door prep and repair. Commercial and residential locksmithing.
Length Of Course: 2 week, day course

Foley-Belsaw Institute of Locksmithing

6301 Equitable Rd.
Kansas City, MO 64120
816-483-6400
FAX: 816-483-5010
Correspondence
Course Descriptions: Basic locksmith skills including lock picking, masterkeying, Burglar and fire alarms, high security, safes and vault locks.
Length Of Course: 65 lessons including 24 lessons of advanced locksmithing. Average 6 months to complete.

Golden Gate School Of Lock Technology

3722 San Pablo Ave.
Oakland, CA 94608
510-654-2677
FAX: 510-654-5816
Resident
Course Descriptions: Locksmith course covers all basic aspects of locksmithing. Electronic security covers auto and residential alarms, access control systems, CCTV, and electric strikes and locks.
Length Of Course: Day locksmith course is 12 weeks, 240 hours. Evening locksmith course is 26 weeks, 234 hours.

Granton Institute Of Technology

263 Adelaide St. West
Toronto, Ontario, Canada M5H 1Y3
416-977-3929
FAX: 416-977-5612
Correspondence
Course Descriptions: Basic locksmithing. Starts with the history of locks and keys. Outlines the trade's tools and over twenty types of locking mechanisms.
Length Of Course: Three Months
Notes: Registered with the Province of Ontario as a Distance Education Institution and accredited by the National Accreditation Commission (Canada).

Lock And Safe Institute Of Technology

1650 N. Federal Hwy
Pompano, FL 33062
305-785-0444
Resident and correspondence courses available
Course Descriptions: Detailed and in-depth studies of commercial and residential locks, safes, doors, and foreign and domestic auto lock service. Commercial and residential. Correspondence students receive instructor calls and videos with their lessons.
Length Of Course: Resident course is 420 hours. Correspondence course is 277 hours. Correspondence hours can be applied to resident hours.

Lockmasters®, Inc. Professional School

5085 Danville Rd.
Nicholasville, KY 40356-0637
606-885-6041
FAX: 606-885-7093, 800-654-0637
Resident and correspondence
Course Descriptions: Resident courses include GSA/government security containers, professional locksmithing, safe deposit/lever lock servicing, safe lock servicing, basic safe penetration and combination lock manipulation.
Correspondence courses include safe lock servicing, safe deposit lock servicing, and combination lock manipulation.
Specialty classes include electronic access control and theft methods and prevention.
Custom one day seminars on varying topics are also available.
Length Of Course: Resident courses vary from three to ten days.
Notes: Each resident course has accredited CEU's.

Locksmith School, Inc.

3901 S. Meridian St.
Indianapolis, IN 46217
317-632-3979
Resident
Course Descriptions: Basic locksmithing. Advanced course includes safe lock servicing, pushbutton lock installation, and electric strike installation.
Length Of Course: Basic is 10 week, 60 hour course. Advanced is four week, 24 hour course.
Notes: Accredited by the State of Indiana Commission on Proprietary Education.

LTC Training Center

P.O. Box 3583
Davenport, IA 52808-3583
800-358-9393
FAX: 319-324-7938
Resident and correspondence
Course Descriptions: Installation/Field Service of and Application and Design of CCTV systems.
Length Of Course: Three days on Installation/Field Service. Two days on Application and Design.
Notes: Instructor approved by National Burglar and Fire Alarm Association for CEU credits.
Correspondence accredited by NAAA as part of their CCTV accreditation program.

Messick Adult Vocational-Technical Center

703 S. Greer
Memphis, TN 38111
901-325-4840
FAX: 901-325-4842
Resident
Course Descriptions: Locksmithing I, Locksmithing II and Locksmith Workshop. Courses include key identification, rekeying, basic masterkeying, key reading, auto



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lockouts, lock and auto service, impressioning, picking, use and maintenance of key machines, code work.

Length Of Course: Locksmithing I and II are 20 three hour evening sessions. Locksmith Workshop is 10 three hour evening sessions.

North Bennet Street School

39 North Bennet Street

Boston, MA 02113

617-227-0155

FAX: 617-227-0155

Resident

Course Descriptions: Curriculum

includes security devices and their application; service and repair of mortise, cylindrical and bit-key locks; key identification, cutting and duplicating keys; masterkeying; installing common locking devices and hardware; auto opening and service; safe manipulation; electronic and mechanical access systems; and safe manipulation.

Length Of Course: 36 weeks (1170 hours).

Notes: Accredited by the Accrediting Commission for Career Schools/Colleges of Technology.

NRI Locksmith School

McGraw-Hill Continuing Education Center

4401 Connecticut Ave., NW

Washington, DC 20008

202-244-9812

FAX: 202-244-2047

Correspondence

Course Descriptions: Courses cover house and apartment locks, automobile locks, security systems and devices and more. Special training on the basics of starting a business, establishing good customer relations, selecting a business location, basic business practices and record keeping for the locksmith business.

Length Of Course: Not listed.

Notes: Approved and accredited by the National Home Study Council.

Pine Technical College

1000 4th St.

Pine City, MN 55063

612-629-6764

FAX: 612-629-7603

Resident

Course Descriptions: Twenty separate courses including lock installation, blueprint reading, lock and key identification, basic electricity, auto lock servicing, Introduction to Locksmithing Systems, and Introduction to Locksmithing Tools, internships, business ethics, masterkeying, life safety codes, electronic locks, and advanced lock topics.

Length Of Course: Courses range from 2 to 5 college credit hours.

Notes: Minnesota State Department of Education approved and meets educational standards as prescribed by the United States Office of Education.

Prince George's Community School

301 Largo Rd.

Largo, MD 20772

301-322-0871

FAX: 301-808-0960

Resident

Course Descriptions: Series of courses covering all aspects of locksmithing. Includes training in basic locksmith skills, basic and advanced masterkeying, servicing exit devices, tubular key servicing, cabinet hardware, codes, high security cylinder service, detention locks, remote electrical door access, low voltage electronics, alarms, lever locks and electromechanical devices.

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LIGHTER SIDE

Getting In

"Some people never learn!" a locksmith from Florida recently said to me. We were at a convention, and a group of locksmiths were lolling about, as locksmiths at conventions are prone to do, swapping tales of our experiences, between classes and clinics.



by
Sara Probasco

According to this particular man, a couple who called on him, from time to time, possessed only one set of car keys. As so often happens, one or the other of them frequently managed to lock these keys inside their vehicle, resulting in having the locksmith get them in. Finally, they decided they'd had enough, and they had the locksmith make a spare set for them.

Off to the beach they went, confident they would have no further lock-out problems. Wrong!

After changing into their swim suits, he packed everything from the car into the trunk for safe-keeping. Pausing prudently, as a result of their past experiences, he shouted above the roar of the surf, "Honey, where are your keys?"

Nodding in recognition, she held up her purse and pointed to it.

He smiled in return, displaying his keys before putting them into his swim-suit pocket. Then he slammed the trunk and reached to help his wife gather the chairs, cooler, beach towels, umbrella, and other paraphernalia that seemed essential to the success of their day.

He quickly decided they were trying to carry too much.

"I'm going to put the cooler back into the trunk," he shouted. "We can get it out later, when it's time to eat." Opening the trunk with his keys, he set the box inside, started to return the keys to his pocket, looked at them thoughtfully, and decided to stow them in the cooler, rather than risk losing them on the beach. After all, his wife had hers in her purse, right?

His load somewhat lightened, he started down the beach.

His wife, similarly burdened, had second thoughts about some of the gear she was trying to carry, so she unlocked the trunk and tossed in a yard chair. As she started to close the trunk, she looked at her large, bulky purse. Did she really need to carry that? The only things in it she would need were sun lotion and her keys. The bottle of lotions would fit into the pocket of her beach coat, and her husband had the other set of keys.

Zippering her purse closed, she tossed it into the truck.

Seeing what she did, from afar, her husband dropped his gear and began waving his arms frantically, shouting, "Whoa! Don't close the trunk! My keys are in there!"

She heard her husband shouting, but she couldn't understand his words. Reaching up, she grasped the trunk lid and slammed it down, before shouting back to him, "What did you say?"

Oops!

The locksmith tried to remain solemn and sympathetic when they related the experience to him, while

he was getting them into their trunk.

"Did you hear about the woman in Cincinnati with electronic locks who couldn't get into her vehicle?" Don asked me later, when we were comparing true-life tales we had heard.

"I'm not sure. Tell me more," I replied.

He couldn't suppress a giggle, as he began the story.

Someone had told about an elderly customer of theirs who called one day to say she couldn't get into her car. The vehicle had electronic locks, and they wouldn't work.

Going to her rescue, the locksmith asked for the combination and tried it for her, but he had no better luck opening it than his customer had.

"You must have re-set the numbers, at some point, and forgotten," the locksmith finally said.

"No," the woman replied haughtily, "at least, not since I first changed the factory combination and replaced it with the numbers I just gave you."

"Have you had the vehicle serviced, recently?" the locksmith asked.

The woman replied, "As a matter of fact, I just got it back yesterday from having some work done, but they didn't work on the door locks."

"Nevertheless, that's probably the source of your problem," the locksmith informed her. "If they disconnected the battery cable for any reason, the keypad combination reverts back to the original factory numbers. In other words, the

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WELCOME TO THE SHOW!

This special supplement of *The National Locksmith* is devoted to educating you, the security professional, about the security products on display at the ISC East Show and to help you profit most from the highly lucrative security industry. This is the fifth annual supplement written and edited by the staff of *The National Locksmith* for the ISC East Show. The show itself is in its 27th year.

Again, the show is held at the Jacob Javits Convention Center from Tuesday, August 30 through Friday, September 1. Manufacturers and distributors, including some who have advertising in this section, are on

hand to demonstrate their products. They are offering you the opportunity to learn about the newest and best products available from the security industry.

Please turn to Page 10 of this Show Guide for the beginning of our Product Showcase section, which highlights many of the security products important to the locksmith trade.

At the bottom of each item and advertisement is a Rapid Reply number. To receive free information about products in

this issue, circle the corresponding number on the Rapid Reply card and return it to us for processing.

This year's conference hours are Monday, 1 p.m. to 5 p.m.; Tuesday and Wednesday, 9 a.m. to 4:30 p.m.; and Thursday, 9 a.m. to 11 a.m. Show hours are Tuesday, 10 a.m. to 5 p.m.; Wednesday, 10 a.m. to 5 p.m.; and Thursday, 10 a.m. to 3 p.m.

If you have any questions concerning this show or future ISC shows, call 203-325-5000 or write Reed Exposition

Companies, 1100 Summer St., Stanford, CT 06905. Tell them you heard about their shows from *The National Locksmith*!

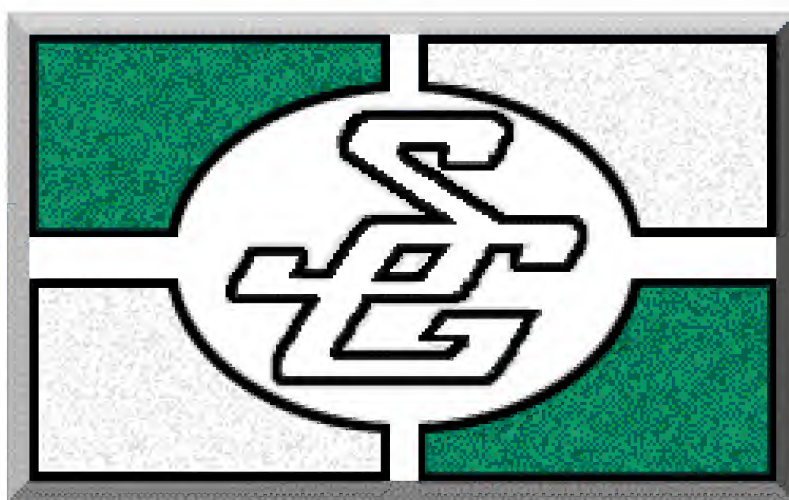
ON THE COVER

This cover features the latest in key/electronic access control integration, the Micro Card by Winfield.

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ACCESS CONTROL BASICS

*There are four components to an access control system:
the controller, the reader, the barrier and the door monitoring device.*

By Chris Weldon

Access Control by definition can be any device that restricts or limits access of humans or vehicles to a particular area. The system can be as simple as a single door mechanical lock or as sophisticated as a networked, multi-door, multi-user system supported by a host computer. The more sophisticated systems can restrict access by user, door, time and date and can provide an audit trail of system activity on a printer or computer. Computer based systems usually allow the System Administrator to produce customized reports of user activity.

Although there are a number of components that make up an access control system, they generally fall into four categories:

1. Control and Processing Equipment, "Controller."
2. User Validation Devices, "Reader."
3. Door Locking Mechanism or Barrier.
4. Exit Devices/Door Monitoring.

The control and processing equipment, "Controller," is the brain and heart of the system. (See photograph 1.) All components are connected to and supported by the controller. Controllers support a specific number of doors. If more doors are required, add another controller. Most of today's controllers use "Distributed Processing," whereby all decisions to grant or deny access are made at the controller, not a host computer. The controller contains a clock, user information, etc. to make access decisions, then sends the result of the transaction to a printer or computer. The controller contains at least one relay to control each door, and sometimes additional relays for alarm condition annunciation. The controller is



1. Controllers come in various sizes with varying functions dependent on the application. Smaller, single door systems may have the controller onboard the reader while larger more sophisticated systems are computer based.

programmed and monitored by either a custom programmer, a terminal, or more commonly a computer running the manufacturer's proprietary software. Most systems allow connecting of multiple controllers together with a computer to form a large networked system.

be a finger print reader, voice reader, hand geometry reader, retina scan reader, or other types of "Biometric" readers.

Frequently two reader technologies are combined, usually keypad and card reader, for higher security or advanced control applications. The



2. The keypad is a common reader used in alarms and access control. Other reader types include various technology card readers and biometric readers.

The device most users will come in contact with is the validation device. (See photograph 2.) This component is commonly a keypad or card reader, but for higher security applications the validation device can



3. Electric strikes and magnetic locks are among the most common electric locking devices.

reader takes the information presented to it, keypad code or card information, and sends it to the controller for verification and a decision is made based on user, door, time and date whether to unlock the door.

If access is granted, the controller actuates a relay, which either applies voltage (Fail Secure Electric Lock) or removes voltage (Fail Safe Electric Lock), allowing the person to open the door. (See photograph 3.) The controller could also control a turnstile, parking gate, or other type of barrier. Most controllers require separate power be supplied to control the locks, and is usually located near the door to minimize voltage drop. Be sure and provide standby power to the locks if you want the system to operate during power outages. Fire



4. Door switches are often added to increase the security of an access control system.



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system interface to the lock power supply may be required to allow free egress in the event of a fire. Note: Always make sure lock type meets local codes.

The last category of equipment used in access control systems is the exit device and door status switch. (See photograph 4.) These items are optional on most systems but are strongly recommended for greater degree of control and security. An exit device, or "RQE" (request-to-exit) is used for two purposes. If the door hardware and/or lock require the controller's relay to actuate to release the door, then an RQE device is required. An RQE device is also required if there is a door status switch monitoring the door position, so the controller will momentarily mask / shunt the door alarm. The RQE device can be a simple push button, push bar, or motion detector. The door status switch provides increased security by monitoring for "Door Forced Open," "Door Open Too Long," and providing "Auto-Relock" when the door closes. Note: Always make sure egress method meets local codes.

There are many other items that can be added to enhance an access control system, like local door annunciators, and other functions they can perform, like alarm monitoring, elevator control, HVAC control, and equipment control.

The author is a CCTV/Access Control Specialist for Arius. For more information contact Arius at 800-432-3232.



ACCESS CONTROL DESIGN

Following a few guidelines, designing and setting up an access control system can be easy.

By John Coker

There are six key parameters in any access control system that must be determined before the appropriate system can be selected and designed. Most vendor products are segmented by these different parameters.

- Number of doors being controlled? (Allow for anticipated future growth.)
- What reader technology is desired? (Keypad, ScramblePad, Mag Stripe, Wiegand, Proximity, Combination.)
- Number of users requiring unique code or card?
- Is door alarm monitoring required? (Door Forced, Door Open Too Long, Auto-Relock.)
- Is an audit trail of user activity required? (Real time printer, computer.)
- Is a computer wanted for programming, monitoring, reporting, and control?
- Additional things that need to be determined to complete the design of an access control system.
 - What type of locks are required for each door? (Each door may be different.)
 - What is the voltage and current draw of the locks?
 - Is any modification required to door hardware? (Automatic closer, key in knob, etc.)
 - What are the wiring distances
- between the controller and the door; between the lock power supply, controller, and door?
- Where can the wiring be run? (Ceiling, conduit, plenum ceiling, surface mounted.)
- Will request-to-exit devices be required? If so, what type? (Push button, motion detector, push bar.)
- How long does customer want system, including locks, to operate in the event of a power failure? Can system be tied into emergency generator circuit?
- If door status monitoring is required, what type of contact switches are appropriate? (Surface, recessed, balanced, colored to match frame.)
- What other devices are to be monitored? (Holdup, glass break, intrusion sensors, equipment.)
- What other devices are to be controlled? (Lights, machinery, elevators, HVAC.)
- What level of training, documentation, and service is required?

After determining all of the above parameters, the appropriate system for the application can be selected and designed.

The author is former manager of Arius Access Control Sales.



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PRODUCT SHOWCASE

Macintosh-Based Badging System By Cardkey

Cardkey Systems, Inc. has introduced the new Cardkey Reflection Video Imaging and Badging System that allows users to design custom photo identification and access control cards for use in personnel management and access security environments. The new system runs on the Apple Macintosh



personal computer and takes full advantage of the user-friendly system's high-performance characteristics and graphical user interface (GUI) for card and background color design, video and graphic capture, image compression and manipulation, and database management.

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Securitron's New Line Of Vandal Resistant Push Buttons

Securitron introduces its all new PB4 series of vandal resistant buttons.



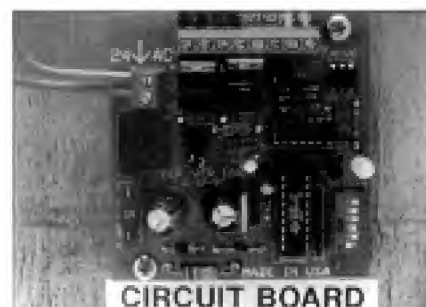
All PB4 versions feature a solid steel push button element which is specifically-designed to resist blows and other attempts to damage the unit.

Switch output is SPDT with DPDT available as an option. The switch contacts are rated at 4 Amps. Momentary and alternate versions are offered and the unit is supplied on a stainless steel single gang or narrow stile plate. A bicolor LED and tamper proof screws are included as standard. In addition a retrofit backbox is included for single gang versions.

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NT Monarch's New Control Board for Delayed Relatching

NT Monarch Hardware, a Newman Tonks company, has developed a power supply that provides greater



control of ELR (electronic latch retraction) devices. The RDS (Relatch Delay Power Supplies) Series controls the time it takes the door to relock after it has been opened during egress.

NT Monarch designed the relatch delay for projects requiring panic hardware in security access or power operator applications where simultaneous activation of the device and the control is impossible.

Relatching time can be adjusted in two-second increments up to 126

seconds. Extra time is often needed in such cases as where doors are used by handicapped persons.

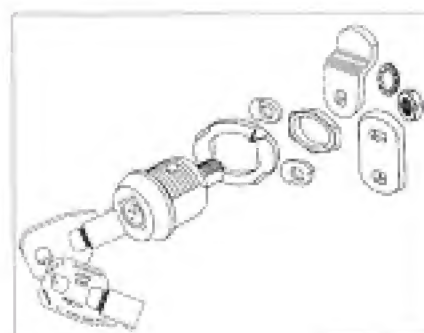
The RDS Series, which is ANSI Grade 1 certified, has a self-checking microprocessor with multi-color LED indicators enabling the operator to monitor the control board and the lock's status.

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Chicago Lock Company's Improved Ace II Universal Function Lock

Recognizing that America's locksmiths must carry more and more products to meet customers' expanded security needs, Chicago Lock Company has introduced a new ACE II Cam Type Universal Function Lock. The kit for this Universal Function Lock contains all the parts necessary to make a variety of lock configurations.

Now the locksmith has more



versatility than ever before. The new Universal Function Lock also saves locksmiths time and money because they can carry fewer locks and still have all the products needed by the customers.

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Radionics New Readykey Access Control Products

Radionics, Inc., a leading manufacturer of electronic security communications equipment announces the launch of a series of Readykey multi-function door controllers.

This new generation of door controller is available as a K2100 four door controller, or a K1100 two door controller. They represent a significant leap forward in terms of power and functionality for the Readykey product



line. Either one can be used as a Master, Remote Master or a Slave in a network system, or as a stand-alone unit.

Features of the K2100 and K1100 include: Two or four door versions, multi-function door controller (used as master or slave), integral power supply- switchable 12V/24V lock power, local or PC administration (MS-DOS/Windows), user definable relay responses for alarm and building management functions, and a printer/RS232 connection.

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Samsung Optical America Introduces Video Door Phone Security System

Samsung Optical America has introduced the SAV400Y combination intercom and door entry security system that can be used both in



residences and businesses. Installation and operation are simple.

The system's outdoor unit incorporates a CCD camera for high resolution and an electronic auto-iris for automatic adjustment to changing light conditions. Six infrared LED's provide illumination in low light conditions. A built-in condenser microphone, speaker and call button are also provided. Viewing angle is 60 degrees horizontally and 50 degrees vertically.

The indoor monitor features a telephone style handset speaker with volume control and a monitor button to view the entry area undetected. A 4" diagonal flat screen black-and-white display provides 400 lines of resolution for exceptional clarity. An electronic door release is featured for optional door strike release. A door chime sounds when the call button is pressed on the outdoor unit and the video image is automatically activated on the monitor.



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A 65', four-conductor cable is supplied with the system. An optional second monitor station is also available.

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DoorKing PC Programmable Phone Entry

DoorKing has introduced it's new Model 1815 telephone entry system to the market. The 1815 is designed with user friendly features and is programmed remotely from a personal computer by using the DoorKing Remote Account Manager software and a modem.

The 1815 system is designed to be easy to use by persons who are not familiar with telephone entry systems. The system's electronic display is designed in a single line format and uses 1/2" characters, making it very easy to read. The display has a life expectancy of 100,000 hours, an important feature considering the system operates 24 hours a day, 365 days a year.

A 48 character user programmable message and operating instructions scrolls from right to left when the system is not in use.

The 1815 has a built in 2400 baud rate modem which allows for rapid transfer of information from the PC to the system. DoorKing has developed a software program for the 1815 that allow even the novice computer user



to program the system. The PC will maintain an accurate record of all the information stored in the 1815 system. And, when data in the system needs to be changed, it can be done right at the computer, and then transferred to the entry system via modem. Additionally, two card readers or programmable receivers can be added to the system making it ideal for most access control needs.

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Tripp Lite Inverter Line

Tripp Lite introduces a brand-new inverter line designed to provide 120 or 230 volt AC power in a wide range



of locations from a DC battery power source. The Automatic Power (APS) Series features 400, 750 and 1250 watt models with a wide range of performance and convenience features for both 120 and 230 volt

installations in a home or vehicle (RV) where shore power is available.

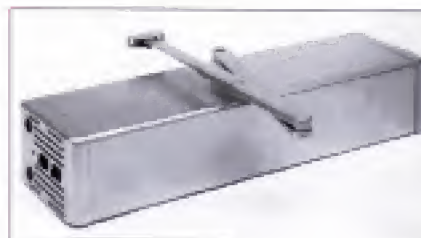
All APS models produce a highly efficient PWM (pulse-width modulated) waveform with a peak-power capability twice the rated output of the unit to start and run large motors and power-hungry devices.

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Dorma ED 800 Low-Energy Power Operator

Dorma has introduced the ED 800, a surface closer-based, low energy power operator that precisely senses the door environment and responds appropriately.

The ED 800 is both ADA and NFPA 80 compliant. It fulfills the universal need for constant, reliable control of normally closed doors, and the occasional need to power them open for the physically challenged.



One universal ED 800 design can be easily configured for left or right hand doors, push-side or pull-side mount, power-assist or low-energy operation.

In its standard mode of operation, the ED 800 has all the features of an ANSI/BHMA Grade 1 door closer. When used as a low-energy power-open operator, ED 800 will open the door with a force that never exceeds 15 pounds. When configured as a power assist unit, ED 800 allows the door to be opened by lightly pushing on it with a force of approximately 1.5 pounds.

An optional push and go mode is also available for special situations in which every pedestrian is physically challenged. In this mode, a slight movement of the door itself triggers the power-opening cycle.

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READER TECHNOLOGIES FOR ACCESS CONTROL

*From keypad to Star Trek,
reader technology varies in price, security and application.*

By Bill Alexander

In today's world of Electronic Access Control there are three major types of reader technologies being used: Knowledge Based, Possession Based, and Physical Characteristic Based.

KNOWLEDGE BASED

Knowledge Based readers are primarily electronic keypads which simply require the user to Know a code number to gain access. Standard keypads are popular because they are inexpensive and do not require cards to operate the system. Standard keypads have always been considered low security because someone can simply observe users entering their code and steal it. The Scrambling keypad is an excellent solution to this problem. The Scrambling keypad randomly displays the digits in a different location on the keyface each time it is used. In addition, there is a built in viewing restrictor which prevents reading of the digits, except by the person standing directly in front of it and entering their code. These two features make the Scrambling keypad the only choice for a secure keypad for use in medium to high security applications where the codes cannot be stolen by observation.

POSSESSION BASED

Possession Based readers are where the user is required to Possess a card or other token to gain access. There are several different cards and reader technologies available, each with it's own advantages and disadvantages. The three most commonly used are detailed below. Others include Barium Ferrite, Bar Code, and Data Chips.

Magnetic Stripe

This type of card is similar to your bank or gasoline charge cards where the card has a stripe of magnetically encoded numbers and is read in a reader when the card is inserted or swiped through a slot. This technology is very popular because it is inexpensive for both the readers

and cards and users can encode their own cards. Mag stripe cards are considered relatively lower security as they are more easily duplicated.

Wiegand

This type of card and reader technology was invented by John Wiegand (hence the name) and uses a series of embedded wires in the card to create a unique code. As the card is passed through the magnetic field created by the read head the Wiegand wires in the card induce a series of pulses in the coil, creating a binary encoded site code and PIN number. This technology is very difficult to duplicate, offering a relatively higher degree of security. Wiegand readers are weather resistant because there is no exposed reader head. In addition, because there is no contact between the card and the read head, reliability of the card and reader is very high. Wiegand cards and readers are moderately priced, being more expensive than mag stripe, but less expensive than proximity cards and readers.

Proximity

Proximity cards and readers derive their name from the fact that the card must only be brought within close range (normally 4" to 8") of the reader to be read, a great convenience for the user. Proximity, like Wiegand, is very difficult to duplicate, offering a high degree of security. Because there is no slot in the readers, they are much less prone to vandalism than other technologies. In addition, proximity is very popular where aesthetics are important as the reader can be mounted within most walls. The primary disadvantage to proximity is price, being more expensive than both mag stripe and Wiegand.

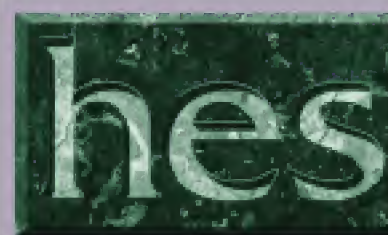
PHYSICAL CHARACTERISTIC BASED

Physical Characteristic Based readers are the kind seen for years on

Star Trek and James Bond movies, but are now a reality. Different types include: retina scan, voice recognition, hand geometry, fingerprint, and handwriting recognition. They all rely on matching a person's unique physical characteristic with a stored template entered when the person was enrolled into the system. They are primarily used in high security applications, being almost impossible to defeat. Drawbacks include high price, slow throughput, and user resistance.

Choosing the best type of reader technology involves many criteria: preference, application, degree of security, and price.

The author is a CCTV/Access Control Specialist for Arius. For more information contact Arius at 800-432-3232.



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SECURITY OR TRAFFIC: DOOR CONTROL

A door's security extends beyond the choice of a lock. The type of door control needed affects the door, the frame and lock.

Many things should be considered when specifying electromagnetic locking systems. Examples include appearance, cost, ease of installation, functional reliability, operating life and security level. This article will take a detailed look at security level, which simply means the amount of physical security that the locking system provides.

Security Level Defined

The required security level of any locking system must be defined by the nature of the anticipated threat. It makes sense to think about two levels: Traffic Control and Security.

Traffic Control means the locking device serves only to stop honest people or petty opportunistic criminals from going through a door. Examples are labs and computer centers within manufacturing facilities and restricted staff areas within public facilities, such as a pilot's lounge in an airport. While wanting to keep unauthorized people out of these areas, a serious assault on the door is not anticipated.

The next higher level, called Security, is meant to stop a determined assault by vandals and criminals. This is appropriate for exterior/perimeter doors through which criminals could gain entry after hours and cause substantial economic loss as well as sensitive interior areas that house items of considerable value.

Role Of The Door And The Frame

Most access control installations consist of adding a lock to an existing door, many times an electromagnetic lock. When doing so it must be remembered that the door and the lock together are the security barrier. It makes little sense to apply an expensive, high security lock to a flimsy door, although it's often done. If security is the intention of adding a lock, make sure the door and frame

are up to the task.

When surveying a door for an electromagnetic lock installation, the first thing to notice about the door is which way it swings. Preferably, it swings out from the protected area, so an intruder must pull to defeat it. A door that swings in to the protected area is more vulnerable because it's easier to crash through a door than to wrench it open.

The next variable is the physical structure of the door. The low security types of doors are aluminum frame glass or hollow core wood doors. It is not only trivial for an intruder to break the glass door to gain entry, but glass doors can often encourage intrusion by allowing the criminal to see inside and identify valuables. Hollow core wood doors can also be easily smashed apart for a quick break in. In both types of doors, the lock valiantly holds on to a piece of the door, which vandals have broken to gain entry.

Electromagnetic Locks

Higher Security doors, such as steel doors, are more likely to survive attack. Because a magnetic lock generally surface-mounts to the door frame, make sure the frame has adequate strength to meet the security need.

The issue of door and frame strength is a real opportunity for the installing dealer. As a security professional, you should insist that the customer define his security requirement rather than define a particular lock he wants you to install. If the door or frame needs to be replaced, you should recommend this and it becomes an additional revenue source. You should also insure that the hinges are strong enough to meet the anticipated threat.

ELECTRIC LOCK TYPES

There are generally two types of surface mounted magnetic locks in broad use today. The smallest

electromagnetic locks are typically in the 400 to 600 pound range, and they should be considered Traffic Control devices. Locks in the 1,000 to 1,500 pound range should be considered Security devices.

Magnetic locks also differ from electric strikes and electric latches in their mounting position. Magnetic locks are generally mounted at the top of the door, whereas electric strikes and latches and some bolts are mounted at the center of the door in the normal knob position. Since the lock is mounted at the top of the door, the door is allowed flex, absorbing quite a bit of the force of the blow used during a forced entry.

A final issue that seems obvious but is sometimes overlooked is whether there are multiple locks. Multiple locks allows for different levels of security depending on (for instance) the time of day. For example, a 400 to 600 pound electromagnetic lock can be installed on a perimeter door during business hours and deliver a Traffic Control level of security. At night, when the building is unoccupied, a mechanical dead bolt is used can be used for Security Control. This is both a common and logical approach.

Each job should begin with the customer analyzing his real security requirements with your professional help and advice. You should then select the proper hardware, while viewing the door and frame hinges and electromagnetic locking technique as a system that must work corporately. By following this approach to the application, you will get a satisfied customer and likely increased revenues by selling more than if you concentrated only on hardware.

This article reprinted with some revisions from the Arius CCTV and Access Control Handbook. For more information contact Arius at 800-432-3232.



Continued from page 52

computer loses its more recent memory."

"My word!" the astonished woman exclaimed, "I never realized the darn thing could develop Alzheimer's."

"People have all sorts of problems getting into their vehicles, don't they," I asked after our laughter had died down. "I remember one friend of ours who had a terrible time with electronic locks when she first bought a vehicle that had them. Her problem was, she was so absent-minded she couldn't remember the combination, remember? She was always calling her husband at work, to get the numbers."

"I never did understand why she didn't use numbers that were easy to remember: some significant date, or part of a telephone number that was familiar to her," Don replied.

"She had taken a safety course at the high school, and one thing they stressed was not using such numbers, saying it was too easy for a thief to discover, as with a safe combination. She thought she should use some obscure number that had no significance."

"That's fine, in theory," Don said, "but what good is it, if you can't remember it, yourself?"

"Speaking of getting into cars, I heard a new one the other day," I said.

"Oh? What's that?"

Someone had told me about getting a call to open a new car. The woman said she had left the only set of keys inside on purpose, since the dealer had given her a "credit card" key to carry in her purse, for emergencies. However, she said impatiently, she had tried and tried, but for the life of her, she couldn't figure out how to use it.

When the locksmith arrived, the woman wasn't around, so he set about getting the door open on his own. She finally walked up, just after he had gotten it open.

"Now," she said, "I want you to show me how this credit card key works, so I won't get in this fix again."

She pulled a plastic card from her purse – one with the two emergency keys cut-outs molded into the central part. Holding the card in one hand, the woman went from place to place around the door, trying to insert the entire card somewhere.

"I can't find any place it will go," she said, obviously frustrated. "Do you suppose my car is defective? There doesn't appear to be a slot for the key-card, anywhere."

She obviously thought the card was

to be inserted as some of the newer hotel keys are, into a slot in the door, thus causing an electronic mechanism to release the lock. Imagine her surprise, when the locksmith showed her how to bend the plastic key away from the frame and insert it into the lock!

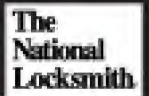
"Well, there's one thing, for sure," Don said to me. "As long as there is any way to mess up on getting into somewhere, we locksmiths will continue to be in demand."

"You got that right!"



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by
Dale Libby

THE DIEHARD DIEBOLD

Read on for alternate methods of attack and servicing procedures on the Diebold CashGard Lug Door.

A few articles ago I promised a smattering of additional information on this most diabolical of money chests using the generic name of Diebold CashGard round door lug safe. If you have to open one of these units, then I strongly suggest that you use either a side or top opening as was mentioned in the previous article. (See *The National Locksmith*, July 1994.) If you are a glutton for punishment and massive drill bit expenditure, then read on for alternate methods of attack and servicing procedures.

These units are round door lug chests. This means that when the bolts are extended, the door does not turn in a clockwise direction. When the proper combination is turned (hopefully) the bolts retract in a 'right to stop' motion of the combination lock dial.

The handle is then lifted (turning clockwise) and the heavy door is moved allowing the inner and outer locking lugs on the door perimeter and the door itself to clear for opening. Sounds easy, but in reality, much can go wrong with lug doors in general, and these Diebold doors in specific.

Lug doors in general must be adjusted so they turn easily. The tolerance between door and frame is

sometimes just a few thousandths of an inch. Even if these doors are adjusted properly, care must be taken to keep rust and corrosion off the mating surfaces.

Door adjustment is accomplished in basically the same way. There is an Allen screw to loosen on both hinges (upper and lower) and the door is screwed or wrenched higher. When the proper height is reached, the door turns properly in the frame. At this point, the hinge pins or adjusting bolts are tightened.

In severe cases, new bearing surfaces or plates must be made to accomplish a smooth working of the door and frame. On a worn door, one must either be a machinist or have the access to a machine shop to make the proper parts. The door hinge mechanism can be removed and worked on by leaving the door on the safe in a locked position after the dial and ring have been removed. Again, not a job for the novice.

In photograph one we see again the Large CashGard TRTL-30 and the smaller TL30. Note the hinges on each safe. They are much different. The chest on the left has an inside attachment while the one on the right has outside configuration.

The hinges on these units do not give away the mechanism on the inside, necessarily. What gives this 180-55 lock away is the soft click or stop which is felt when rotating the dial past zero. I have only encountered this lock on round door lug safes.

Photograph two exhibits the way the back cover is attached to the safe door. There are three screws that go through the cover and attach to the back of the combination lock cover. The cover is threaded in both the large and small door to accept these specific screws.

Photographs three and four demonstrate the difference between the large and small doors and their corresponding bolts. In the bigger door, the bolts are longer. The combination lock mechanism, relockers, dial and wheel pack are identical in both money chests, only the length of the bolts have been changed to protect the innocent. This locking arrangement can be used on an infinite number or sizes of doors.

One of the three relocking devices is shown in photograph five. Each bolt has its own individual relocking device that acts like a guillotine. When the back cover is punched or disturbed, these three snappers (that are not attached to the back cover, but to the



1. Large and small Diebold CashGard Money chests. Note different hinge configurations.



2. Back cover of door is held on with three screws that bolt directly to the back of the combination lock.



inside of the chest door) spring into place denying further movement of the individual bolts.

The bolts in both chests are in the same position when locked and fit into lug cut outs. The positions for these bolts are at 11, 3, and 7 o'clock respectively. If the relockers are ever set off, one's best chance for opening this unit is to drill and cut each bolt with a carbide hole saw similar to a GSA opening procedure. I have never had to do this personally. When I do, I'll let you know.

Photograph six shows the inside of the combination lock minus the wheel pack. There is an opening in the wheel hub at 9 o'clock under the two part spring loaded driver, at the gate of the drive cam. If you drill this door, this is the point to look for. However, to drill at this position, one must break off the dial and drill 1" out at number 14.

There are many problems with this. First, be prepared to use many carbide and regular drill bits and to test out your hardplate drilling rig and, not least of all, your patience. Next, when you do reach the inside of the door,

you will see a front mounted driver with the wheel pack behind.

This is a real pain, for you must dial and turn, dial and turn, until you get all the wheels lined up exactly under the spring lever. If you have a flexible borescope of tiny diameter, this can be accomplished a little faster. Once the lever has dropped into the gates of the wheels, the entire wheel pack and bolt plate must be turned to withdraw the bolts.

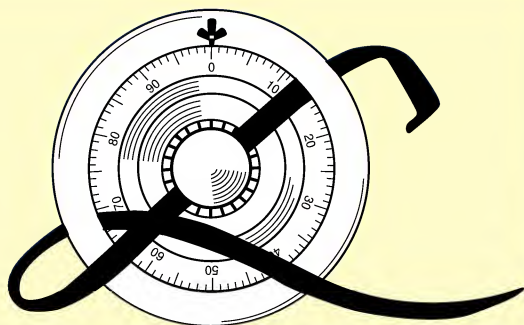
Just another note about this unit. In the past couple of years I have serviced about six of these CashGard Lug Door units. They take a specific change key that can be ordered from Diebold for about \$10. There is no substitute for this proper change key.



3. Bolt and lock pattern on smaller TL30 door. Note the short length on the three locking bolts

The length is important as with the stops on the key and back cover. Do not try to modify another change key to work. It will not.

Even though the 180-55 is a key change lock, and thus self-indexing after the combination has been changed, I have not seen a virgin wheel pack. On all the units that I



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have taken apart for proper full servicing. I have seen the wheel gates filed or cut wider. We, as RST safe technicians know why this was done. With the proper change key, this does not have to be done. Do it right, and the wheel gates will not have to be widened.

It is easier to write about this than to do it. Once you have tried a front penetration, I doubt if you will do it again. Now the nasty news. The dial you broke off to gain positioning for drilling is almost impossible to obtain.



5. View of the guideline relocker on upper bolt. Each bolt has its own relocker.

If you have an in with Diebold, you might be able to get one in four weeks at a cost of over \$223, plus shipping. That is right. We are talking about only the dial and spindle, not for the whole lock.

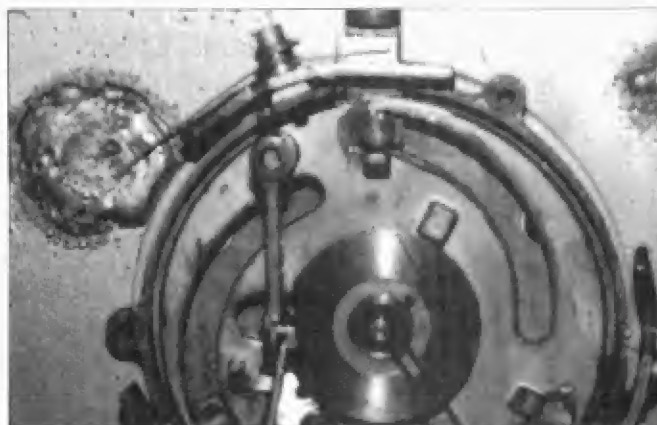
I asked a Diebold representative about the prohibitive cost and non-availability of this dial and he stated (with his nose in the air) that Diebold was not a "parts house" for locksmiths. They were a manufacturer and not a supplier of safe and chest parts. Case closed!



4. Bolt pattern on the TRT-30 door. Note the longer length of the locking bolts.

So, in conclusion, if you decide to front drill one of these units open, as Dave McOmie would say, "Bring Your Lunch!" Explain to the hapless (helpless) customer about the repair (or non-repair) of the chest and quote your price accordingly. My real advice on money chests of this ilk is to first purchase a 90 degree long borescope, and either top or side drill. All the Diebold 180-55 locks are key changeable and can easily be opened for drilling for the hole, reading the combination at the change index, and transfer-ring your readings to the opening index.

SIDE DRILL AND PROSPER!



6. Inner view of cam plate and drive cam with two part spring loaded MP device. Window for drilling is a 9 o'clock in the picture at cam side.



PRISON
SECURITY

by

Rick Segerstrom



FOLGER ADAM'S MIGHTY NEW MOGUL

"No other cylinder, that I am aware of, offers the different levels of security, key control, and keying options that this cylinder does."

Sitting around the OMNI, a Dallas, Texas locksmith and I played a little guessing game concerning new detention hardware. Now it's your turn.

See if you can name the brand of lock I am talking about. Clue one: This lock has pins angling towards the center of the lock which ride in "dimples" cut into the side of the key. Clue Two: This lock has two rows of vertical pins. One row is in the standard configuration, the other row is parallel to the first row, and are interlocked with the pins coming into the center from the side. Clue Three: There are different levels of key security, available from the manufacturer, and through distributors. Well what do you think? Primus, ASSA, KABA, MIWA?

No, its not any of these. Let me introduce you to the Maxi-Mogul™ cylinder from Folger Adam. This cylinder is unique in its design and level of security. No other cylinder, that I am aware of, in the detention field, offers the different levels of security, key control, and keying options that this cylinder offers.

If you will look at illustration one you will see the basic concept behind this cylinder. Notice the pins entering from the side. Notice how they interlock with the vertical pins coming from the top. With the key removed, the side pins push the secondary vertical pins up, thus preventing the shear line. When the proper key is inserted, the dimple cuts in the side of the key allow the side pins to align thus dropping the vertical stack to the proper shear line. In conjunction with this

shear line, the proper cuts must be in the keyblank to align the primary pin stack to shear line. All of these factors must be correct for all three shear lines to be formed, thus allowing the cylinder core to turn. Folger Adam refers to this as the "solid locking triangle."

Picking any mogul cylinder is difficult to say the least, but imagine how impossible it would be to pick this cylinder. Not only do you have to pick one row of pins, with steel ball bearings at the bottom riding on the surface of your pick, but you have to simultaneously manipulate three rows of pins, two of these rows being interlocking.

This cylinder is precision machined from a solid bar of 2-1/4" brass alloy. To defend against attack with tools, there are hardened inserts positioned in the body to prevent drilling of the pin tumblers or sawing. Let's bear in mind that inmates have more time

than any other commodity. With time on their side, they can conceive of ways to thwart security devices you or I may never dream of.

Folger Adam offers three distinct levels of security in regard to this cylinder. The first level consists of the six pin tumbler mortise type cylinder with a single row of six vertical chambers. This level offers key exclusivity on a regional basis. Level one also offers key duplication by the user. I imagine that level one is best to the areas where the inmates have key access, such as their own individual cell. Level one has its own key grooving as well. The sections "E" and "F" as well as the composite "EF." Key groove "E" and "F" will not pass each other, while composite "EF" will pass both.

Level 2 has the standard six vertical tumblers, and allows for up to two horizontal tumblers for superior pick resistance and exclusivity. Keys are available directly from Folger Adam Company, and with special arrangements from the factory, end users may perform standard cuts, but not the side dimple cuts. This level of security is recommended for areas like corridor doors, interior entryways, vestibule doors. The key sectionals for level two are the same as level one. "E," "F" and the composite "EF." Remember though that the keys in level two have the side dimple cuts.

Level three is the top level of security. These cylinders are equipped with six conventional vertical chambers, and three to five side tumblers chambers, and three to five top, interacting chambers. Three separate



This new mogul cylinder by Folger Adam incorporates several pinning configurations that allow for varying levels of security and control.

Continued from page 60

tumbler combinations totaling twelve, fourteen or sixteen make this a most secure cylinder. There is exclusivity of keying codes guaranteed throughout all of North America at this level! This level carries its own key grooving. The sections are "G" and "H" with the composite "GH." As before, the "G" keys will not enter "H," nor vice versa, and the "GH" composite will enter both. Level 1 and Level 2 keys will not enter a Level 3 cylinder. Key blank control at this level is totally factory controlled.

I almost left out the technicals:

Construction

Cylinder body: machined from a 2-1/4" brass bar.

Cylinder balls, plug and change tumblers: Stainless Steel.

Side and Top tumblers: Brass.

Key: Copper alloy, Hard temper.

Net wt: (Pay attention) 1 lb. 10 oz.!

Thread type: 2-27 Class 2-A

Security

Hardened inserts to resist drilling. Bottle type pin drivers for pick resistance. Cylinder balls to reduce key wear.

Finishes Available

US4, US10, US10B, US26, and US26D.

As much as I wish I had, I haven't had to rekey any of these type of cylinders. I would guess that at level one, the rekeying and masterkeying would be very straightforward. When it comes to level two, and especially level three, I am sure you will have to contact the factory and purchase the necessary keys, and individual pins directly from them.

It may seem odd to have to order a set of individual pins from a factory to rekey a mortise type cylinder, but in the detention field, this is commonplace. I myself have many times ordered a rekey set, and received pins taped in sequence, ready for my insertion.

A word to the wise; Don't drop a pin or spring. You'll need it. I don't remember where I read it, but I recall a saying I have used many times that applies here: "The distance a dropped pin or spring travels, is directly proportionate to the degree of difficulty in obtaining a new one!" How true!

A personal note, I have enjoyed reading the many letters from you concerning your thoughts on the Detention Lock field of Locksmithing. Your comments and suggestions are much appreciated. If you have any topic of interest regarding Detention Locks, please write to *The National Locksmith* and let me know.



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BUSINESS BRIEFS

News from the Locksmithing Industry

INDUSTRY INTERVIEW...

Recently, *The National Locksmith* had an opportunity to interview AMSEC Technical Service Manager Shane Crosby. Following is an excerpt of that meeting.

TNL: Shane, can you tell us a little about how you became involved in the safe and security industry?

SC: My father was a tool maker, so some of his knowledge must have rubbed off on me. I found my way into locksmithing about 10 years ago after a career in writing and the Merchant Marine. Some of the mechanical problems on ships at sea are the same as any business on land. The only difference is the distance to the hardware store. After working five years for a busy locksmith shop on Cape Cod, Massachusetts, I joined the staff of the Safe & Vault Technicians Association. There, I found myself helping locksmiths open and service hundreds of different models of safes. When SAVTA moved to Dallas with ALOA, I stayed with Lockmasters in Kentucky doing marketing, and technical writing and conducting seminars around the country.

In February of this year, I moved my family to California to join American Security Products Company as their Technical Service Manager. At AMSEC my office gives technical support and customer service for the thousands of AMSEC, Major and Star safes that are produced each year.

TNL: Through that time, what was the most enjoyable aspect of your positions?

SC: Helping technicians and their customers. That is what it is all about. No one has all the answers, but, with a little digging and some clear thinking just about any problem can be solved.

TNL: What was the most challenging aspect of your career.

SC: Keeping up with the constant flow of advances in products and techniques.

TNL: What changes have you seen in the industry throughout the years?

SC: It was not too long ago that individual employees were assigned to making sure that the safes and locks in their business were "tended to" - meaning that locking devices had their "quirks" and needed special attention. They knew they had to pull the key out a bit and wiggle it, or had to push on a certain spot to make a safe door open. This belief was similar to medications; that, in order for a pill to work, it had to taste bitter. In locks, it was in order to be secure, it had to be difficult to operate. The world is



Shane Crosby
AMSEC
Technical Service Manager

turning faster these days. An individual's time is more valuable, and their attention has to be directed at more things.

"User friendly" seems to be the goal in virtually every aspect of the physical security industry. It is only natural for consumers to want "no hassle" operation in everything they depend on - from

lawn sprinklers to access control.

Personal safety, for example, can mean the difference between life and death. Individuals rightly expect the equipment they rely on to work at the push of a button.

In our industry, the demand for dependability is also there. While balancing between being user friendly and dependable the bottom line is always going to be "Keep them out. Let me in."

This demand puts a large burden on locksmiths and manufactures.

TNL: What direction do you see our industry taking?

SC: Electronics. I know many locksmiths wince at the word, but if you can make oatmeal with peaches in a microwave in one minute, you should be able to unlock whatever you consider valuable at the push of a button.

By no means is this a new fad. Anyone who has been in this industry for even a few years has seen more and more wires and batteries controlling everything from car door locks to bank vaults.

Electronics and their ability to instantly control access have become more and more refined since the days when "pinball machine" parts were opening locks.

TNL: How has this change affected locksmiths?

SC: They've made things more difficult. And the difficulty for the locksmith is the wide variety of devices out there. Now, the locksmith must be able to identify and service literally dozens of different electronic products, each with their own traits. You have to be able to find the right product - at the right price - to fit the individual needs of your customer. If you don't, that customer will go elsewhere.

Training is more and more important, if the individual

...INDUSTRY INTERVIEW

wants to succeed. It is not so much a case of components being more complicated. Actually, these devices - from all manufactures - are rapidly becoming easier to work on (For example, crimp tools for plug-in jacks have replaced solder guns.) It's just that locksmiths need to pursue education and training with the new devices that are out there.

TNL: What changes do you think the locksmith must make to be successful?

SC: There are no "changes" necessary to be successful. Success is built into each person, perhaps genetically. The desire to succeed is as natural as the desire to live. The only elements that can be added are continued training (either through seminars, classes or publications) and the ability to accept setbacks and learn from mistakes.

Professional associations - local and national - are increasingly more important for the individual's growth. By gathering together, the exchange of ideas helps all involved. Associations are also in a strong position to influence legislation relating to the work locksmiths do. Back them in their efforts and give input on your concerns. Any legislation relating to the work you do will have direct impact on your success.

TNL: What do you think the future holds for the locksmith?

SC: The demand for a physically safe environment will never stop. Locksmiths are the basic component to physical security. Locksmiths meet directly with the individual consumer and can best advise that person as to their security needs. By constantly presenting themselves as professionals who take their customers safety seriously, locksmiths will grow in this challenging industry.

TNL: How can the locksmith best serve their customers?

SC: Honesty, integrity and a sincere desire to help people are the basic parts of helping the customer.



Kwikset Corporation announces its sponsorship of **Habitat for Humanity International** and its **Jimmy Carter Work Project '94**. The Jimmy Carter Work Project



Habitat for Humanity volunteer installing donated Kwikset locksets.

represents 16 special projects and the construction of a total of 413 homes around the country. The first project is the building of 30 homes in Americus, Georgia, the home of Habitat, between June 12 to 18. This undertaking is a landmark event in the history of Habitat for Humanity in that it represents the 30,000th house built worldwide by Habitat since its founding. Former President and Mrs. Jimmy Carter are area residents and will be on hand to work on construction along with other volunteers.



John Casey and William Cimino

The worlds first **Speedypik** was officially sold to **John Casey** of **Locks & Keys Inc.** Woburn MA. **William Cimino**, CEO states that **Speedypik** has finally gone to market after almost six years of Research and Development.

Corbin Russwin Architectural Hardware has announced the appointment of **Larry O'Toole** to the position of Vice President, Sales and Marketing. Mr. O'Toole joined Corbin Russwin in 1983 as a sales representative, became Sales Manager in 1986, Marketing Manager in 1989,

and was named Director of Marketing in 1993. He holds a BS degree in Marketing Management and a Masters degree in Business Administration.



Larry O'Toole

The **Central and Southern Colorado Locksmith Association** elected new officers for 1994. They are **Richard L. Dyer**, President; **Barry Meyer, RL**, Secretary; **Paul Arens**, Treasurer; and **Gordon Racine, CML**, Member at large.

Philip N. Haselton, Detex President, announced the retirement of a well known industry figure, **Robert M. MacDonald, Director of Sales and Marketing**. MacDonald joined Detex Corporation just prior to it's relocation to New Braunfels, Texas from Chicago in 1981. Moving up through the ranks within Detex, MacDonald has served in a number of capacities and is known throughout the industry for his knowledge of door security hardware applications.

Construction of a \$2 million manufacturing plant for **Meilink** safes is underway and will be operational this summer. Located in New Albany, Ind., the new facility will have 40,000 square feet of manufacturing space and 3,000 square feet of office space.



An architectural rendering of the new Meilink safes manufacturing plant.

"By more than tripling our size, we'll be able to operate more efficiently, which will be a big benefit to our dealers and customers," according to **Van Carlisle, President and CEO of Fire King International**, the parent firm of Meilink.





by
Jake Jakubowski

THE HUNT CONTINUES

"Thar ain't nothin' stoppin' you from huntin' with the big dawgs 'cept your own unwillin'ness to git out there an' try to outrun the pack."

You may recall reading my article "Huntin' With The Big Dawgs", which appeared in the March, 1994 issue of *The National Locksmith*. For those of you that didn't read the article, I outlined some ideas I thought just might allow small, independent locksmiths to hunt with the big dawgs occasionally rather than "stayin' on the porch". In fact, I made the statement that "... you can often out hunt the big dawgs!"

As expected, there were a few howls of protest from some big dawgs, worried apparently, because some small dawgs might decide to join the hunt. Even some of the dawgs that decided to stay on the porch (nothing wrong with that decision.) set up to see what all the fuss was about.

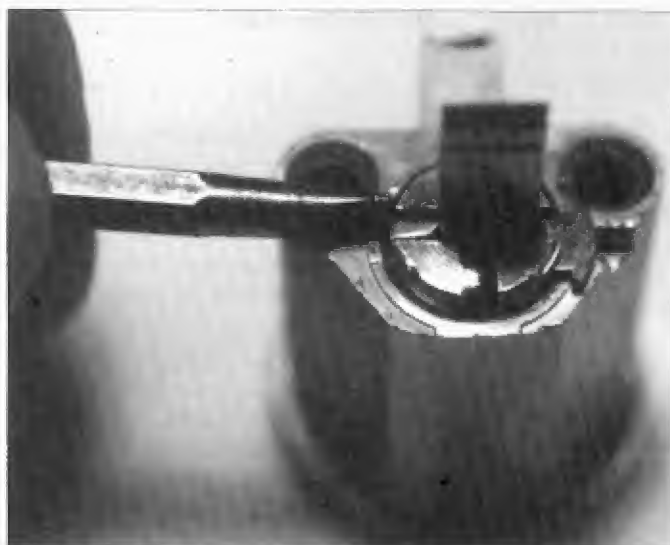
I also suggested in the March article that if you were interested in going after some of the high dollar business that normally only the larger, better equipped, funded and staffed shops would bid on, you could, if you wanted to, effectively bid on

that type of work. In other words, "thar ain't nothin' stoppin' you from huntin' with the big dawgs 'cept your own unwillin'ness to git out there an' try to outrun the pack."

Once you realize that the only thing keepin' you on the porch is your own attitudes then, not only can you hunt with the big dawgs but, every once in a while, you can end up bein' top dawg. All that you need is a little grit in your craw (also called: "Chutzpah." Which ain't Bubba-ese but, roughly translated, means: "Brass-bound gall" or "That dawg's right spunky, ain't 'e?") and a willingness to try something a little out of the ordinary to win some of those high dollar jobs.



1. Huntin' with the big dawgs means bidding on jobs like this, 200 plus doors including panic hardware.



2. Most of the work on this job was tedious and time consuming, but simple. This Yale rim cylinder is just one style lock that needed rekeying.



3. Coop locksmith partner Pete Gamble.

Continued from page 66

'Course, the possibility exists that if you do try huntin' with the big dawgs you just might get slap out-run, out-hunted and outta breath.

What you won't get is chewed up and spit out, clawed to pieces, pistol whipped or scarred for life. The worst thing that's going to happen is you will spend time putting together a proposal that is unacceptable. Under ordinary circumstances that simply means you devoted a small amount of your energies, for a short period of



4. Darryl Campbell also cooped this job

time, bidding a job that you did not get. Would that be a disaster?

Did you consider not getting a job a catastrophe? Not likely. So why let the prospect of losing a bid on the occasional large job make you run for the porch with your tail 'tween your legs? The very worst thing that will happen is someone will say, "No!" to your proposal. I don't know how you might feel about it, but since I'm usually a fairly optimistic person, I figure that every time someone says "No!" to me ... I'm that much closer to a "Yes!".

Besides, the more often you hunt with the big dawgs, the more chance you have of catchin' somethin' big. But, if you don't never hunt nothin' but chipmunks ... you ain't ever gonna catch a deer!

The first thing you want to recognize is that the "customer" you're trying to "get," doesn't really care how many trucks you have or how many people you have on your payroll. They don't usually care whether you had steak and potatoes

for supper or ham hocks and hominy grits. What they do care about is whether you can deliver the job they want done within the time frame they want it and at a price they feel is reasonable (not necessarily the cheapest). If you can convince them that you're able to do this; you jes' might have caught you your first "deer."

The second thing you must be absolutely certain of, is your ability to complete the job as you promised your customer you could. What I mean is, if you're biddin' on a really big master key job that has to be done in a short period of time, you had best make sure you understand the principles and mechanics of masterkeying. And, be positive you have sufficient help (who also understand masterkeying principles) to bring the job in on time. Otherwise, you're only bayin' at the moon, an' might jes' as well stay on the porch.

And, finally, you need to be absolutely sure you want to hunt with the big dawgs to begin with. You see, if all you've been huntin' is chipmunks, squirrels and an occasional rabbit, you need to be real certain you truly want to chase down and catch a deer. Why? Because when you catch a chipmunk or squirrel you can jes' pick 'em up and tote 'em on home. But, when you catch a deer ... you have to work to get that meat home! 'Course one deer can make up for a whole passel of small game. Consider how many cars you would have to open in two or three days to make what you could make masterkeying 200 doors in the same length of time.

Now, let me show you how you might be able to hunt with the big dawgs and occasionally grab a bone from them without gettin' bit ... or worse!

Photograph one shows a 200 plus door facility that I submitted a bid on to re-key. The plant was about two years old and nearly everybody had a masterkey (which was the reason for the rekey). The Director of Maintenance (DM) wanted the job done over a single week-end. Considering the types of hardware involved, this job did not sound - at least initially - like the kind of hunt the



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average small dawg would want to run in.

About a third of the locks were Yale key-in-knob sets (easy enough), with six or eight mortise cylinders (as basic as it gets) scattered around, and the rest of the doors to be rekeyed had panic hardware (time consuming.) with rim cylinders on them. In addition, some of the panic devices needed repair (somewhat tedious and time consuming) or replacement, and a dozen or so rim cylinders on the panic devices needed to be upgraded from Yale 5-pin to Yale 6-pin. (See photograph 2.)

The first thing I did after finding out what dates the DM had in mind, was call Pete Gamble and Danny Campbell, two locksmith friends of mine, who had co-opped large jobs with me before. (See photographs 3 and 4.) I outlined the scope of the work to them and asked them if they thought we could do it over a weekend, and whether they would be available on the dates that the company wanted the work done? They answered yes to both questions, and I asked them to reserve the dates in question and I'd get back to them.

Then, I went back to my contact at the plant and asked him if it would be possible to separate the repair and replacement work from the actual rekeying. I told him that by "staging" the work, the rekey - which was the most important part of the job could easily be done over a weekend - could be given priority and the repair/replacement work could be done the following week. He agreed with the idea ... as long as I would guarantee the repair and replacement work would be completed by the following weekend.

The next step (and, for those of you who may have never tried to bid on a large rekey, a nearly critical step) was to actually walk the entire plant and diagram every door and lock. You see, doing a large masterkey job is like taking a cross country trip the diagrams that you develop at this point become your roadmap for the trip. The more detailed your "map," the easier your trip. After completing the diagram(s) the DM and I sat down to discuss the actual keying.

For instance, the Administrative Offices would be keyed differently from the Technical Support Division, which would be different from the Research Department, etc. In other words, we determined what keys (and the total number of keys needed) were going to fit what doors, and whose keys were going to be "sub-masters" for their departments. One concession I was able to win was to have the exterior doors on a separate key, which eliminated the need for cross-keying the exterior doors.

Even though this necessitates designated employees having to carry two keys, it increases the security on the exterior doors since only the master and one change key operate the lock. Also, you gain the benefit of having to only rekey the exterior doors in the event that an employee with the "X" key leaves or is terminated.

With all the pertinent information and specific requests regarding this job in hand (and on paper), I was able to set down and formalize the bid. Included in the price of the bid would be the time that I spent surveying the

job, diagramming the doors, developing the keying charts, biting arrays (the masterkey system), and getting everything on paper.

Also, I had to get back with Pete and Danny to make sure that what I was factoring into the bid for their share of the job would be satisfactory with them. It was.

Note: When you're "subcontracting" with a qualified locksmith that is capable of giving you the level of competency you need on a job like this, don't get chintzy with money. Pay them well.

Obviously, I got the bid. The Friday morning that we started the job, Pete, Danny and I walked the entire plant to familiarize them with the lay-out. I gave them each a copy of the biting list and plant diagrams (here's another reason to spend the time necessary doing the paperwork; it makes it easier for everyone to do their job properly, with no guesswork), and assigned each of us to a specific area of the plant.

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The next step was to cut and stamp the keys that we were going to need. (See photograph 5.) Once we had enough keys cut to get started, Pete and Danny started rekeying and I continued to cut and stamp keys. When I finished that, I also began rekeying.

Our first day, we worked 9-1/2 hours, and our second day we worked 10 hours. I had allowed the third day (Sunday) in case we could not finish up on Saturday. In all, we cut nearly 400 keys, rekeyed all the locks in the plant and surrounding out buildings (mostly rim mounted panic devices) in a total of 582 man-hours (less breaks and lunch hours). I figure that we averaged rekeying, including cutting the keys, about one lock every 20 minutes.

Maybe that's not a world record but, when you consider the amount of panic hardware and the walking time necessary (this job covered a lot of territory), I don't think

we did too badly. Then, when I consider what we netted per man-hour, it was definitely worth our time and trouble. Also, when I add in the repair and replacement work which was under a separate bid, I'm truly glad that I didn't "stay on the porch."

So, if you feel you want to start huntin' something besides small game, get out there an "hunt with the big dawgs" occasionally. You don't need to have employees, because you can develop a network of locksmiths that would be willing to co-op with

you. You don't need a lot of financing, because other than buying pins and key blanks, your investment in even a large a re-key job is relatively small.

If you'll go back and read over March's article, you'll find that I suggested that if large amounts of new hardware were needed, you could give the hardware sale away, and make your money installing it. If the new hardware needs are minimal, you can increase your profits from the hunt by selling the customer the hardware and charging for installing it.

You can make good money "huntin' with the big dawgs" if you're willin' to join the hunt and get a little creative in the way you think about those really big jobs. So, the next time you git the scent of a deer out in the woods, git yerself offen that porch an' run with them big dawgs! Ya'll heah?



5. Yours truly cutting the 400 plus keys needed for this job



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THRU THE KEYHOLE



A Peek at Movers & Shakers in the Industry

ATTENTION MANUFACTURERS AND DISTRIBUTORS: Would you like your company and products to be profiled in *Thru The Keyhole*? Please call Managing Editor, Tom Seroogy at (708) 837-2044.

CORBIN RUSSWIN SEMINARS

When most people think of a manufacturing company, loud machinery and long assembly lines come to mind. These may be the activities behind the scenes but manufacturers today, especially those in the hardware industry, have a greater responsibility than just production and shipment of their products. One such responsibility is to provide proactive training to the hardworking locksmiths who maintain their products in the field. This training can help in the installation and maintenance of hardware products, especially those that relate to life safety and security.

For many years Corbin Russwin held annual training seminars at its facility in Berlin, Connecticut. The seminars usually lasted two to three days. Although effective in educating attendees in code requirements, and installation and maintenance of Corbin Russwin products, the classes were only able to reach a small number of people each year.

In response to requests that we provide additional classes on a local basis around the country, Corbin Russwin has developed a field training program that enables Corbin Russwin Sales Representatives and authorized distributors to conduct seminars in the field. Since establishing this outside training program, over 3,500 locksmiths and facilities maintenance personnel have attended seminars that were sponsored by local Corbin Russwin distributors and supported by the factory. Each Corbin Russwin Sales Representative has the training materials to work with a distributor in

conducting seminars for up to 20 attendees at a time. Seminars can be half or full day and can be catered to specific needs of a particular class in a local area.

These seminars include information on the following topics

- Key-In-Lever Locksets – installation and changing cylinders.
- Mortise Locksets – installation, reversing the hand and converting knob to lever.
- Push Bar Exit Devices – installation of rim, vertical rod and mortise devices.
- Door Closers – installation and adjustment.

Each product area is introduced with an interactive video that enables

attendees to work hands on with product samples. In addition, complete technical manuals are provided with illustrated drawings of the products for repair and replacement of parts. Qualified factory representatives and Corbin Russwin distributor personnel lead the classes, providing informative input as well as creating a forum for attendees to share their own helpful experience in working with locksets, exit devices and door closers.

For more information on these seminars contact your local Corbin Russwin distributor or Sales Representative. If you would like the name of your local distributor, contact the Corbin Russwin Customer Service Department at 800-543-3658.



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The Lund two-tag key control system.



The America Key Box by James Victory of America Lock and Safe.

LUND KEY CONTROL

Changing locks costs money. When a key is lost it means confusion and a loss of time. A key that is not returned when an employee leaves or when a key is mislaid is a security risk. A properly installed key control system can reduce the chance of keys going astray, at low cost.

For over 45 years, Lund Equipment Co., Inc. of Bath, Ohio has specialized in key control systems with key capacities ranging from 10 to 3,400. The system utilizes a steel key cabinet with hinged steel panels. The cabinets are 18 gauge steel with gray baked-on enamel. Doors have chrome-plated cylinder locks. Each hook and key is identified by number from one to 100 per panel. A file key tag and a duplicate key tag is provided for each number.

This system is called the two-tag key control system. It lessens the risk of theft by keeping keys under lock and key, accessible only to authorized employees. The two-tag system keeps a permanent pattern file key on the hook (it is never loaned), a temporary duplicate key, also on the hook, that is loaned under strict control, and a three-way cross reference index book for recording key information.

The chief advantage of the Lund Key Control System is visible key control and visual inventory. A key receipt card is supplied for each key hook. The receipt is signed by the person receiving a duplicate of the file key. A quick glance will show any missing keys that are not accounted for.

The installation of the Lund Key Control System is easy and quick. The cabinet is furnished with key hook labels and green vinyl shield that fit directly over the hooks.

There are three basic steps to set up the system: 1. Collect the keys; 2.

Identify the keys; 3. Index the keys.

Collect The Keys

Lund provides key collection envelopes for the capacity of the cabinet. The envelopes have spaces on them for lock and key data (i.e. location, door name or number, lock manufacturer, key series number, the number of keys in the envelope and masterkey system identification).

Before recording any information on the envelope, check each key with the lock for proper operation. Number each collection envelope in numerical order, starting with the number one. Collect and check keys for all locks and place them in separate envelopes. Bring all completed envelopes to the key cabinet. Identify The Keys

Remove an original key from envelope one. Attach it to the octagonal File Key Tag No. 1. Now attach the rest of the keys in the envelope to the oval No. 1 Duplicate Key Tag and hang over File Key Tag No. 1. Repeat this operation until all keys are tagged and filed in the key cabinet.

Index The Keys

A book index is used to record file key numbers three ways:

1. Numerically, by File Key Tag number.
2. Alphabetically, according to the name of the Lock Location.
3. By Key Change Number, numerically according to the manufacturer's lock number.

Using the information on the Key Collection Envelopes, first make up the Numerical Index, starting with File Key No. 1. Insert all key information under the proper headings. The Alphabetical Lock Location Index will probably be the most frequently used.

Finally, arrange the Key Collection Envelopes for the Key Series Index. This is done by arranging the

envelopes in alphabetical order according to the names of the lock manufacturers, with the key series number for each manufacturer in numerical order.

Key Receipt Cards

Key receipt cards are furnished by Lund, to be hung on the key hook when keys are issued. The person taking the key must sign the card, on which is entered the key number and date.

The Lund Key Control System is the result of over 45 years of development. It is in use in apartments, office buildings, schools, institutions, prisons, motels, hotels, factories, military installations, garages, etc. For information, write to the Lund Equipment Co., Inc., P.O. Box 213, Bath, Ohio 44210.

AMERICA KEY BOXES

Whether you're a big-city locksmith in competition with dozens of others like yourself, or the only source of salvation for people within a 100-mile radius, you know how quickly lack of organization can do you in. Conducting an extended hunt for the right key can cost you time, money, and sometimes even the job.

James Victory of America Lock and Safe spent 15 years "walking the talk" of organization. Victory is a former Texas law officer, arson investigator, and police chief, and has logged thousands of hours in organizing the details of criminal investigations. "I've always been involved with community service and security," He said.

With this experience, Victory understands the necessity of organization. After graduating from Foley Belsaw with 350 keys and a locksmith's certificate, it didn't take him long to figure out that hanging his keys on a pegboard doesn't keep them organized. It's too easy for keys to fall off and get confused with other keys.

Even worse, there's no good way to group keys by type. And how can you work efficiently when you're walking back and forth between your van and the lock location, searching for the key blank that fits?

After unsuccessfully trying several different products and methods to keep his keys organized in the truck, Victory decided to build a box and customize it with features that would suit his needs.

"I had three goals," he said, "The first, was to create sliding panels. This organizes my keys by type, and makes it possible for me to easily remove and carry only the set of keys I need for a particular job."

"Second, I wanted to build the box in such a way that I can either install it in my van's cabinet, or put a cushion on top and use it for a seat at my bench. This frees up more space in my van." He says.

"Third, I wanted to use materials that hold up longer, and keep the box looking good for a long time. It seemed like scratches and dents started showing up on my first box only a few weeks after I bought it." He said.

The America Key Box is the result of Victory's insight and practical creativity. The box panels and hooks are constructed of heavy duty 18-gauge metal, stronger and more durable than the lighter-weight 20-gauge metal that many key boxes are made from.

The box has ten panels which slide both out and up, so you can place the box either vertically or horizontally, depending on your needs. Each panel has 50 hooks, for a total of 500 different keyways, and each hook holds approximately 14 keys.

Wanting to create the ultimate in convenience, Victory even put an extra space between key hooks to allow plenty of room for large-headed keys, such as those used by foreign car manufacturers and specialty keys. To finish the product, Victory decided to use a baked coat that provides a hard, brilliant surface which is both scratch resistant and attractive.

The key box can be installed as easily as attaching it with screws to a workbench.

For more information on the America Key Box, call or write James Victory, 4520 Forest Hill Circle, #13, Fort Worth, Texas 76140, 1-800-561-5397.



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BITS & PIECES

Informative Tidbits for the Security Industry

Silca has just released their updated 1994 Automotive, Truck, and Motorcycle Cross Reference Guide. This manual is an encyclopedia of automotive information including year, make, model, code series and keyblanks. It's a perfect reference manual for both shop and mobile use. To get your copy, contact a Silca distributor.



by
Tom Seroogy

Hey, can anyone tell me if the following is a scam? Several of our readers have received phone solicitations from a Standard Tool & Lock Company located in Longwood, Florida (just north of Orlando). Apparently they are selling a set of General Motors tryout keys to locksmiths for \$199.95. According to one reader the company claims these "keys are currently only being sold to locksmiths but may be sold to auto dealers at a later time."

Having never heard of Standard Tool & Lock, I contacted them looking for a sample set of the tools to try — five times! I left messages for "Jim" the manager (owner?) and have been "guaranteed" a return call. (The first call was placed May 19, 1994.) No response has been made to date.

Telephone information does not have a number listed for a company by that name. Initial contacts with the U.S. Postal Service revealed that the address, initially confirmed by Standard Tool, did not exist. Challenging Standard Tool & Lock with this information, I was given a P.O. Box number in Longwood, Florida that the U.S. Postal Service could confirm.

The Florida Better Business Bureau does not have them listed for complaints, and they are a registered company in Seminole County, Florida. The street address listed with Seminole County is 481 State Rd. 434, Longwood, Florida and a listed phone number of 407-865-6770. That number, however, was not in service at the time of this article. An alternate number, 407-865-5773, provided by a reader, is in service and we were able to contact Standard for questioning.

Other sources within Florida confirm the existence of Standard Tool & Lock Company as a partnership owned by a Steven Pedullo and James Fraser (the "Jim" I'm looking for maybe?). According to one source Standard recently changed their phone number to the above unpublished number.

In my last conversation with Standard Tool & Lock, an employee purported that they have an excellent third party review of their GM tryout keys in the *National Locksmith Register* and that this is the only magazine in which they advertise. They were unable, however, to send me a copy of the article or provide an address or phone number for the *National Locksmith Register*. Again, I was told "Jim" would call me.

While Standard Tool & Lock may be a legitimate company with a legitimate product, it's apparent they're not willing to share the whole story. I certainly hope "Jim" calls to clear this up, until then we're left to our own discretion.

By the way, Federal law prohibits the mailing of lock picks and opening tools and devices to anyone but a locksmith. And, as many of you have experienced, there has been a great many "magical key" auto opening scams within the last few years. These fly-by-night operations generally

contact the locksmith and the auto dealer (our customers) looking for a quick sale.

If you feel that you or a customer has been scammed, file a complaint with your local U.S. Postal Service Inspector. You must supply them with a product, catalog or letter from the business in question. They will refer it to the Postal Inspector having jurisdiction.

R&D Tool Company has announced that beginning July 31, 1994 their products will be handled by distributors only. A listing of R&D distributors and their numbers are to be available at a later date. For more information, contact your distributor or R&D at 505-828-2664, or fax 505-857-0642.

Effective May 1, 1994, S&G locks are going to switch their locks from the familiar gray hammertone paint to a darker gloss gray designated by RP Gray. All S&G combination lock cases and covers are affected.

The reason for the change? To produce a more consistent finish and to more clearly differentiate S&G products from import and domestic copies.

All-Lock has announced a series of new products for the locksmith. Included are specialized automotive tools: the 9902 steering wheel puller kit, 9903 lock plate compressor, 9908 Tilt Telescopic compressor adapter, 9904 and 9905 door panel tools, and the 9907 lock plate tool for non-tilt GM square columns.

Also released is the A6800 Toyota pinning kit. This kit services the

Continued from page 74

Camry split wafer as well as most Toyotas from 1970 and up, Hyundai, Isuzu, Suzuki, Honda cycles, Mitsubishi, Colt, Daihatsu, Sprint, Spectrum, Nova and Luv.

New ignitions include the 1417(U) and 1418(U) for the 1993 and 1994 Explorer and Ranger; the 1438(U) for 1993 and 1994 Crown Vic's, Ford pickups, Lincoln Continental, Town Car and Grand Marquis; the 1439(U) for 1993 and 1994 Taurus/Sable, Aerostar, Bronco, E150/250/350; the 1436 and 1437 for GM's 1992 and 1993 Roadmaster, Caprice (wagon) and 1993 Blazers/Jimmys/S10/Suburban/Bravada

For a catalog of the All-Lock replacement locks, kits and tools contact an All-Lock distributor.

Schlage is accepting nominations for their second annual Doberman Awards. This award is handed out every year to individuals who have become involved and make a positive difference in the security of their neighborhoods. Each year five

winners are chosen. Each winner receives \$500 and is nationally recognized for their achievement.

Co-sponsoring this award is *The National Locksmith's CRIME PREVENTION*® magazine.

Locksmiths who have customers, friends or employees they feel are deserving of this award can send their nominations to: Schlage Lock Company, c/o 1994 Doberman Award Nominations, 901 Battery St., Ste 308, San Francisco, CA 94111.

Silca Key Releases: 1994 Kia, Sephia. Silca KIA1R (Ilco X233, EZ KK1) and Silca KIA1RAP (Ilco KK1-P, EZ KK1-P).

For our friends down under, DHG publications has announced the release of Australian Cam Lock Codes, Volume 3. The book contains 107 pages with over 9,000 different codes for garage doors, cashboxes, security doors, windows lockers and more. Of special interest is the

inclusion of a number of rarer codes, including those for projection locks. Manufacturers include Lockwood, Firmadoor, Lowe & Fletcher, SWS, Lenlok and Loksaf. Cost is \$79 (Australian).

For more information contact DHG Publications at P.O. Box N115, Petersham North, NSW 2049, Australia.

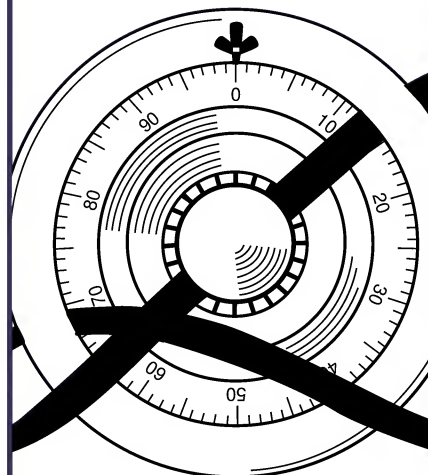
Lockmasters® is offering a five day Electronic Access Control Course. The course consists of four phases or sections covering the history of electronic access control; comprehensive study of electricity, electronic circuitry and measuring instruments; access control components and their functions; and hands-on installation and trouble shooting. The instructor is Marty Bell, tuition is \$1125, and classes are being held in Lexington, Kentucky. The course runs August 15th through the 19th, so sign up now! For more information call 800-654-0637.



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your tips today. You may win cash
or merchandise. At the end of the
year, we choose winners for many
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by
Jake Jakubowski

BEST TIP OF THE MONTH

If your tip is chosen as the best tip
of the month, you'll win \$50 in cash!
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use these bucks to purchase any
books or merchandise from *The
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published will win a copy of the
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- ESP PR-13 Professional Lock Pick Set
- Sieveking Products EZ-Pull GM Wheel Puller
- Technitips Handbook

Submit your tip and win!

AUGUST'S BEST TIP Antique Safe Hinge Repair

When I started locksmithing
back in the 50's the old cast iron
safes that government agencies,
businesses and industry started
replacing with the modern steel
safe, generally ended their useful
life in the scrap yard.

Within the last decade, these
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are in great demand by the general
public for storing everything from
Avon collectibles to Zombie comics.

One of the biggest problems with
these old safes are to be found in
the hinges. The doors are so heavy
that they wear out the hinge pins
and races. This not only causes the
door to close very hard, but
contributes to lock outs as well.
Particularly on safes where the dial
throws the bolts (i.e., McNeal-
Urban).

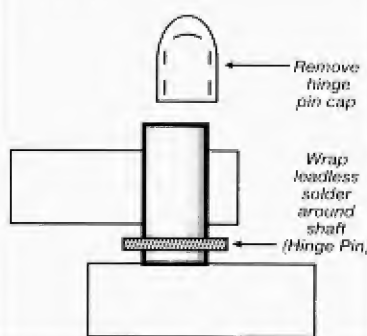
Illustrations one and two show
how the hinges on these safes can
be repaired to give years of trouble
free service.

Especially, if the safe is used in a
residential application where it is
not opened twenty times a day.

Illustration one.

1. Remove hinge caps, if any.

Illustration 1



2. Jack door up about 3/8". Be
careful not to jack door so high that
it comes off the hinge pins.

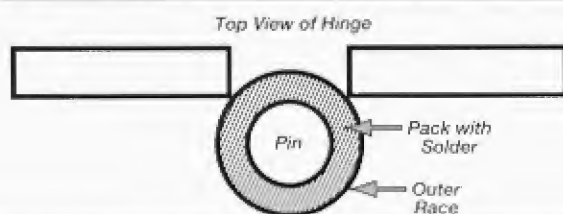
3. Wrap leadless solder around
hinge pin.

4. Lower door and pivot door to
work in solder to build up hinges. I
have found that solder works better
than brass shims because of it's
lubricating qualities.

Illustration two:

1. Center door so hinge pin is
centered in outer race. Note: Think
of the hinge as a simple bearing,
with a shaft and outer race. Years
ago, the outer races on a simple
shaft was poured with "Babbitt" (as
in "Babbitt Bearings"). Babbitt was
a lead-zinc compound.

Illustration 2



2. With shaft (pin) centered, drive the solder in between the shaft and race with a punch or suitable tool. Pack it as tightly as possible.

3. Remove jack or blocking necessary to center pin.

4. Work door back and forth to work in solder.

I think you'll find this makes a very suitable repair.

Raymond Denkwicz
Maine

Editor's note: Issac Babbitt (1799-1862) was a U.S. metallurgist whose original "Babbitt metal" was a soft, white, anti friction alloy of tin, copper and antimony. Later, the term "Babbitt metal" was applied to any of a group of similar, anti-friction alloys (lead/zinc for instance) used for bearings.

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ALL-LOCK VATS DECODER WINNER **Airbag Check**

Before servicing a VATS ignition (with an airbag), you should make sure that the airbag system is functioning properly. Checking the proper function of the system before you service the ignition could save you potential liability later on. The problem that occurs is that in order to test the system, you have to turn the ignition on.

Here's a simple test that's an inexpensive alternative to the pick sets available for GM for the purpose of testing the airbag system when you don't have a key.

You will need a 3' length of wire with a sharp probe at both ends (I use alligator clips on each end of the wire with an upholstery needle in each of the clips).

At the base of the steering column, you will find a square wiring harness. Locate the PINK wire. Do not confuse it with the RED wires!

Once you have located the pink wire, insert your probe through the insulation, into the copper wire itself. Run the other end of your probe to the number one fuse on the fuse block, touching the end of the fuse where it plugs into the block.

The inflatable restraint light should come on and blink about seven times and go out. If it remains on, there is a problem with the airbag system and you should refer your customer to the dealer for service. Do not attempt to service the airbag as you could be held liable for the repairs to the system.

What you accomplished with this test was to bypass the ignition and light up the "idiot" lights on the dashboard. This procedure is completely safe, but for those of you who are afraid of vehicle electronics, you can put a fuse between your test probes.

On some GM vehicles, you may have to remove the panel under the dash to gain access to the harnesses.

I have only tried this procedure on the Caprice but, after discovering it, I consulted a professional Chevrolet master mechanic that the pink wire is consistent with all Chevrolet vehicles utilizing this type column. He also verified the procedure's safety.

Other dealer mechanics (Buick, Pontiac, etc.) would not give me any information when I asked them about the test. I'm not sure if all GM vehicles are the same, but it's worth looking into. I have used this test several times and have demonstrated it to others. It is a time saver.

Lou Frascella
New Jersey

HPC PISTOL PICK WINNER **Car Opening Tool**

Here's a new twist on using the plastic binding strips that you find around large packages as an opening tool.

Cut a piece of the material (it's usually about 1/2" wide) into a 3' length. Fold it in half and crease the center. Now, cut a piece of wet/dry emery cloth (1/2" wide x 4" long), center it over the crease and glue it to the banding material.

You now have an opening tool that can easily be slid between the door jambs or window edges of many different make cars to grab the lock button. It even works on the wide, smooth sided buttons, as well as smaller buttons.

All you need to do is insert the folded end into the window crack or between the weather stripping. Guide the strap until it is near the button and then push or pull one piece of the strap until it forms a "D" shape. Slide it over the button and pull it tight against the button. While maintaining pressure against the button, slide the

end of the strap you're holding towards the top of the door.

Donnie Smith
Virginia

SILCA KEY BLANKS WINNER **Adams Rite Doglatch Fix**

I have found out that on Adams Rite 4710 series deadlatches, the retainer that holds the latch in the open position often breaks away from the lock body. When that happens on either side (there are two of these retainers on each lock) the latch cannot be trapped in the open position from that side of the lock.

One reason that these retainers fail is caused by people trying to turn the key in the wrong direction to unlock the lock. When the tail piece on the back of the cylinder (which will activate the retainer) comes in contact with the retainer, the person tries to force their key even further in the wrong direction.

This will, at first, distort the retainer, and eventually cause it to break. When that happens, you either replace the entire lock, or

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You can use a 1-1/4" mortise cylinder rather than the standard 1" mortise cylinder to bypass the broken retainer. A 1-1/4" cylinder will allow the tailpiece to activate the retainer on the opposite side of the lock. Since these type latches usually have a lever or paddle handle to release them from the inside, the longer cylinder will not interfere with the operation of the lock from the inside.

Steve Briarton
California

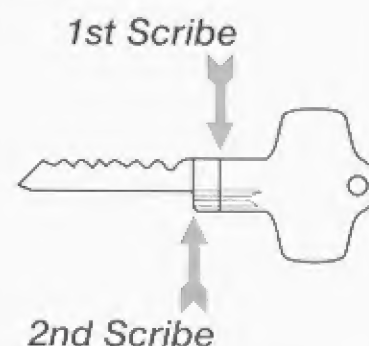
ESP PICK SET WINNER Clogged IC Core Fix

When a Best/Falcon type interchangeable core has some debris lodged in the keyway that you cannot remove (like paper clips, pencil leads, etc.) you can try this time saver.

Cut a spare control key and insert it in a spare core and scribe a line on the key as close to the core's face as possible. Then, remove the key and scribe a second line about 1/16" from the first line towards the tip of the key.

Now grind away the base of the key

Illustration 3



from the key stop (at tip) to the second line you scribed - which would be the line closest to the tip of the key - and from the base of the key up to the first milling. (See illustration 3.) After grinding, finish off the edges with a fine file.

If the grinding was done correctly, you should have enough blade left to fully enter the core and the first scribe line would be your stop indicator. The key biting literally overrides the debris in the keyway and the core can be removed for servicing.

This procedure will save on cores which would otherwise have to be drilled and that makes the procedure cost effective.

Albert R. Pavoni
Pennsylvania

E-Z PULL GM WHEEL PULLER WINNER GM Truck Lock Removal

I have found what I believe to be an easier way to remove, service and replace the door lock on the newer General Motors full-sized pickup trucks.

First, remove the interior panel as you normally would. Then, remove the screws (or nuts) that hold the door handle assembly in place. Tilt the bottom of the assembly out, but don't try to force it further than it wants to go.

Locate the lock retainer and depress it with a heavy wire or a small bent screwdriver. Push the lock into the door cavity.

Disconnect the lock from the linkage (use forceps or small vise grips to hold the linkage while you service the lock).



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Illustration 4 **Grind off shaded areas**



Service, rekey or repair the lock.

To replace the lock you first need to make a copy of the working key. Grind both sides of the head down even with the blade of the key. (See illustration 4.) This allows the key to pass through the hole in the handle assembly.

Now, put the key in the lock and turn it 90° so it can't be pulled out. Start the lock into the handle assembly and connect the lock to the linkage. Now, using your vise grips or pliers, pull on the end of the ground down key blank until it "snaps" into place in the handle.

Replace the retaining screw, and the interior door panel and you are finished!

W. Knuckles

Editor's note: I used this tip without having an address for Mr. Knuckles because I thought it was a tip that needed to be shared and might save my readers some time servicing the newer GM truck locks. Now, I know Mr. Knuckle's first and middle name, if he'll send me his full name and address, I'll send him his prize.

TECHNITIPS HANDBOOK WINNER **Impressioning Aid**

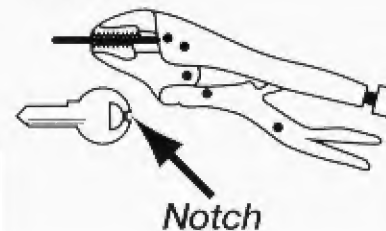
Here's a little tip that should help many of your readers that impression keys and use 4" Vise grips as a holding tool.

I have found that in preparing the blank it helps to first file a small notch in the top center of the key bow by resting in the back of the jaws of the pliers. (See illustration 5.) This will hold the centerline of the key which helps to obtain good marks that might otherwise be hard to see.

This takes just a few seconds longer, but saves time, and I find increases my success rate when impressioning.

Anthony Zorbas
Ohio

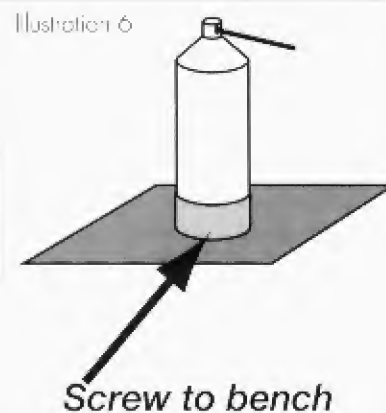
Illustration 5



LOCKSMITH BUCKS WINNERS **Spray Can Holder**

This is a trick that I use in my van to keep cans of TriFlow, WD-40, etc. from rolling all over the place.

Illustration 6



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Remove the lid from your can of lubricant and screw it upside down on your work bench or wherever it is convenient. (See illustration 6.)

The can will fit in the top, right side up and won't wind up under a work bench or on the ground.

Rick Sullivan
Texas

Cylinder Storage/Plug Follower

It didn't take me long after starting my locksmith business to realize that time was money. So, here's a time (money) saving tip that I'm hooked on that's very simple.

I went to the salvage yard and got several pieces of aluminum round stock about 30" long and 1/2" in diameter. I use these bars like a follower. In my spare time I disassemble as many locks as I can using my giant follower to push out the plug. I just keep lining up cylinders on the bar.

The top pins and springs are kept intact and all I have to do is re-pin the plugs as I need them and slide the

cylinder off the bar to reassemble the cylinder just as you would using a regular follower.

Nearly any diameter round stock you might want can be found at these salvage yards.

Jim Yates
California

Key Extractor

Another source of broken key extractors can be found by using scroll-saw blades. The nice feature about these blades is that even after using them in your saw, you can still use the upper portion of the blade as an extraction tool. Just break off the used end and grind or file the broken end to a slight angle.

If you want to purchase the blades, they can be bought at Sears for about \$4 per pack of 12 blades. A #2 blade is .029" wide and .012" thick (Craftsman #927060). And, a #5 blade is .038" wide and .016" thick (Craftsman part # 927061).

These blades are small, maneuverable and can be held in a

pin-vise for greater control. If you buy your blades from Sears just to use as extractors, you can get two blades from each one.

Stanley D. Madsen
Utah

Visit The Library

Here's a tip that can be helpful to the beginner and old timer alike. Use your local library and bookstore to get information to help you improve your skills. By reading the auto manuals, you can get an education on auto doors, locks and linkage rods. You can also review door panel removal procedures and the correct way to remove an ignition.

There is a great deal of information to be had from the auto manuals at your library. Take along a pencil and pad of paper to make notes. You'll be glad you did.

David Weaver
Alabama



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KEY CODES

1994 GM Codes Z000-Z999

HPC 1200 CM

Continental Code Card - #215

Cutter - CW1011

Stop - 1054R Tip Stop (Ford 10-Cut)

Framon

Cut start - .216"

Cut to cut - .092", Spacing Block #3

Cutter - FC8445

Key Clamping - Lay spacing clip

F2MS552 flat on left side of vice and align from tip.

Curtis

Cam - GM6

Carriage - GM6A

KEY BLANKS

B&S 5985936

Silca GM37(EP)

Curtis B82

Iico P1102

Jet B82(PH)

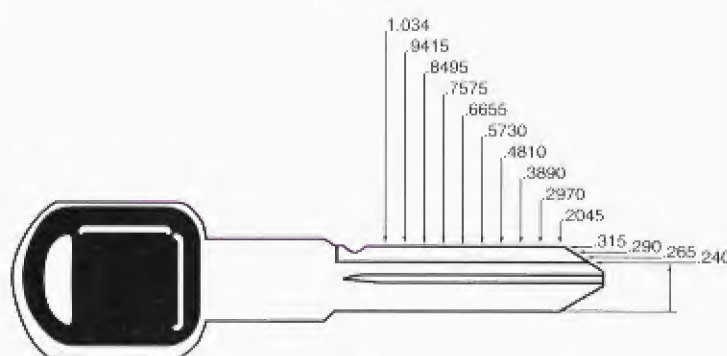
EZ B82

ESP B82

Spacing and Depths using
Universal Micrometer
Card #58.

| | Spacing | Depth |
|----|---------|-------|
| 1 | .1850 | .315 |
| 2 | .2775 | .290 |
| 3 | .3700 | .265 |
| 4 | .4625 | .240 |
| 5 | .5550 | |
| 6 | .6475 | |
| 7 | .7400 | |
| 8 | .8325 | |
| 9 | .9250 | |
| 10 | 1.0175 | |

The new 1994 GM code series includes 405 pages of over 100,000 active codes. GM, however, is not using all of the codes in any given year and the codes are being picked at random. To better serve the locksmith, over the next few months *The National Locksmith* is printing only those codes that have been confirmed to be in use on this year's GM vehicles. If you have a code that is not included, you can get the biting by calling us at (708) 837-2044.



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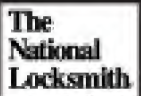
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1994 GM Codes Z000-Z999

| | | | | | |
|------|------------|------|------------|------|------------|
| Z000 | 3223422442 | Z066 | 3223121243 | Z131 | 3221234244 |
| Z001 | 3223421134 | Z067 | 3223124234 | Z132 | 3223342443 |
| Z002 | 3221131213 | Z068 | 3221313322 | Z133 | 3221312123 |
| Z003 | 3223342134 | Z069 | 3221332342 | Z134 | 3221312242 |
| Z004 | 3223122313 | Z070 | 3221224333 | Z135 | 3213434344 |
| Z005 | 3223423312 | Z071 | 3213433122 | Z136 | 3223134243 |
| Z006 | 3224234233 | Z072 | 3223432234 | Z137 | 3221132423 |
| Z007 | 3213431243 | Z073 | 3221133243 | Z138 | 3223223312 |
| Z008 | 3213443324 | Z074 | 3221331312 | Z139 | 3223312234 |
| Z009 | 3223423313 | Z075 | 3221124233 | Z140 | 3224213112 |
| Z010 | 3221124312 | Z076 | 3221331133 | Z141 | 3223433422 |
| Z011 | 3221311334 | Z077 | 3221321342 | Z142 | 3221312133 |
| Z012 | 3221244342 | Z078 | 3223321323 | Z143 | 3223443224 |
| Z013 | 3223313213 | Z079 | 3221334432 | Z144 | 3221312443 |
| Z014 | 3224212332 | Z080 | 3221234344 | Z145 | 3221342334 |
| Z015 | 3213424434 | Z081 | 3223433213 | Z146 | 3223134213 |
| Z016 | 3213423422 | Z082 | 3223132133 | Z147 | 3223221134 |
| Z017 | 3223132344 | Z083 | 3221224432 | Z148 | 3213434224 |
| Z018 | 3221321313 | Z084 | 3221213312 | Z149 | 3223132112 |
| Z019 | 3221223134 | Z085 | 3223434212 | Z150 | 3223342234 |
| Z020 | 3221244313 | Z086 | 3213343113 | Z151 | 3223443124 |
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| Z022 | 3224233434 | Z088 | 3221343313 | Z153 | 3213432342 |
| Z023 | 3221312234 | Z089 | 3223242342 | Z154 | 3213434233 |
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| Z034 | 3221133423 | Z100 | 3221134243 | Z165 | 3223313423 |
| Z035 | 3221334224 | Z101 | 3221123313 | Z166 | 3213432134 |
| Z036 | 3224211244 | Z102 | 3223243242 | Z167 | 3223112432 |
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| Z042 | 3221343222 | Z108 | 3213434222 | Z173 | 3224231344 |
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| Z044 | 3221332344 | Z110 | 3223243122 | Z175 | 3221234334 |
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| Z062 | 3221234323 | Z128 | 3213433244 | Z193 | 3223421232 |
| Z063 | 3213442124 | Z129 | 3213431242 | Z194 | 3223244213 |
| Z064 | 3223432442 | Z130 | 3223113222 | Z195 | 3224243124 |
| Z065 | 3221234422 | | | | |

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1994 GM Codes Z000-Z999

| | | | | | | | | | |
|------|------------|------|------------|------|------------|------|------------|------|------------|
| Z196 | 3223234213 | Z261 | 3223132433 | Z326 | 3221243124 | Z391 | 3221313343 | Z456 | 3221342242 |
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| Z224 | 3213424323 | Z289 | 3221243422 | Z354 | 3223123134 | Z419 | 3221342422 | Z484 | 3223213313 |
| Z225 | 3223243422 | Z290 | 3223232444 | Z355 | 3223431124 | Z420 | 3223442432 | Z485 | 3221133123 |
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| Z230 | 3221133224 | Z295 | 3223344213 | Z360 | 3213442434 | Z425 | 3223423113 | Z490 | 3221213342 |
| Z231 | 3223113422 | Z296 | 3223121342 | Z361 | 3213442323 | Z426 | 3224232344 | Z491 | 3213343424 |
| Z232 | 3223123444 | Z297 | 3224242443 | Z362 | 3221132444 | Z427 | 3213423213 | Z492 | 3213443244 |
| Z233 | 3224231213 | Z298 | 3221213344 | Z363 | 3213443233 | Z428 | 3221342333 | Z493 | 3223434224 |
| Z234 | 3213423344 | Z299 | 3221132443 | Z364 | 3221224433 | Z429 | 3213434423 | Z494 | 3223312134 |
| Z235 | 3223131212 | Z300 | 3223312213 | Z365 | 3223211342 | Z430 | 3221312423 | Z495 | 3223442233 |
| Z236 | 3223213344 | Z301 | 3223244324 | Z366 | 3213432243 | Z431 | 3223424424 | Z496 | 3213342423 |
| Z237 | 3223311224 | Z302 | 3223234243 | Z367 | 3224212334 | Z432 | 3221234233 | Z497 | 3221321244 |
| Z238 | 3223112423 | Z303 | 3221334233 | Z368 | 3213432432 | Z433 | 3223442134 | Z498 | 3223321344 |
| Z239 | 3221211334 | Z304 | 3223121134 | Z369 | 3223211244 | Z434 | 3221334223 | Z499 | 3213431224 |
| Z240 | 3223122134 | Z305 | 3221131312 | Z370 | 3223442313 | Z435 | 3221324434 | Z500 | 3221131222 |
| Z241 | 3223443242 | Z306 | 3223213443 | Z371 | 3224243132 | Z436 | 3221213343 | Z501 | 3221233134 |
| Z242 | 3221332443 | Z307 | 3221221334 | Z372 | 3221323312 | Z437 | 3221324233 | Z502 | 3224243233 |
| Z243 | 3221224313 | Z308 | 3221323243 | Z373 | 3223113134 | Z438 | 3221323444 | Z503 | 3223213444 |
| Z244 | 3221223132 | Z309 | 3221121132 | Z374 | 3213442212 | Z439 | 3221332423 | Z504 | 3224234232 |
| Z245 | 3223231123 | Z310 | 3223112433 | Z375 | 3221331222 | Z440 | 3224223113 | Z505 | 3223243424 |
| Z246 | 3221331343 | Z311 | 3223434213 | Z376 | 3221343113 | Z441 | 3221121332 | Z506 | 3213442442 |
| Z247 | 3224234213 | Z312 | 3221312322 | Z377 | 3221132234 | Z442 | 3223112442 | Z507 | 3224242433 |
| Z248 | 3223131233 | Z313 | 3223121334 | Z378 | 3221131342 | Z443 | 3223133243 | Z508 | 3224211213 |
| Z249 | 3221324234 | Z314 | 3223424434 | Z379 | 3224233432 | Z444 | 3223113113 | Z509 | 3224223444 |
| Z250 | 3223342213 | Z315 | 3213344312 | Z380 | 3221122434 | Z445 | 3223243234 | Z510 | 3223112234 |
| Z251 | 3223321343 | Z316 | 3224211232 | Z381 | 3221133213 | Z446 | 3221131133 | Z511 | 3223443234 |
| Z252 | 3223113434 | Z317 | 3221132334 | Z382 | 3221313432 | Z447 | 3223442342 | Z512 | 3223244342 |
| Z253 | 3223431312 | Z318 | 3224233124 | Z383 | 3223234323 | Z448 | 3213344233 | Z513 | 3223123432 |
| Z254 | 3223423244 | Z319 | 3223321242 | Z384 | 3224243344 | Z449 | 3221311224 | Z514 | 3223224434 |
| Z255 | 3221324422 | Z320 | 3221313242 | Z385 | 3223121344 | Z450 | 3221331212 | Z515 | 3221343424 |
| Z256 | 3223421132 | Z321 | 3223313442 | Z386 | 3224213212 | Z451 | 3223131134 | Z516 | 3213434424 |
| Z257 | 3223133244 | Z322 | 3223424324 | Z387 | 3223442332 | Z452 | 3223113342 | Z517 | 3223324433 |
| Z258 | 3223113444 | Z323 | 3221124324 | Z388 | 3224243432 | Z453 | 3221213133 | Z518 | 3224224343 |
| Z259 | 3213343122 | Z324 | 3224212133 | Z389 | 3223212433 | Z454 | 3213443424 | Z519 | 3221322432 |
| Z260 | 3223122433 | Z325 | 3221242112 | Z390 | 3221131123 | Z455 | 3213423324 | Z520 | 3221223313 |

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1994 GM Codes Z000-Z999

| | | | | | | | | | |
|------|------------|------|------------|------|------------|------|------------|------|------------|
| Z521 | 3223421343 | Z551 | 3221231324 | Z581 | 3213343223 | Z611 | 3223132123 | Z641 | 3221224343 |
| Z522 | 3223112313 | Z552 | 3213344323 | Z582 | 3213421322 | Z612 | 3223132313 | Z642 | 3223121313 |
| Z523 | 3221134212 | Z553 | 3223223133 | Z583 | 3223133224 | Z613 | 3221343233 | Z643 | 3221223112 |
| Z524 | 3223123422 | Z554 | 3221123433 | Z584 | 3221134342 | Z614 | 3223322444 | Z644 | 3221232432 |
| Z525 | 3223324324 | Z555 | 3224232113 | Z585 | 3221131323 | Z615 | 3221321334 | Z645 | 3221322434 |
| Z526 | 3221133444 | Z556 | 3213442422 | Z586 | 3221332244 | Z616 | 3213433124 | Z646 | 3223443112 |
| Z527 | 3221342232 | Z557 | 3223132134 | Z587 | 3223213323 | Z617 | 3223442132 | Z647 | 3213434232 |
| Z528 | 3224231324 | Z558 | 3223313224 | Z588 | 3223342313 | Z618 | 3221321124 | Z648 | 3223434233 |
| Z529 | 3221312244 | Z559 | 3224233244 | Z589 | 3223324232 | Z619 | 3213424232 | Z649 | 3223234244 |
| Z530 | 3223134312 | Z560 | 3221224312 | Z590 | 3223244322 | Z620 | 3221243313 | Z650 | 3221342233 |
| Z531 | 3224221312 | Z561 | 3223423243 | Z591 | 3221342423 | Z621 | 3224213343 | Z651 | 3221231134 |
| Z532 | 3221232113 | Z562 | 3221213322 | Z592 | 3213432213 | Z622 | 3213434323 | Z652 | 3221242434 |
| Z533 | 3213342323 | Z563 | 3213442312 | Z593 | 3223224334 | Z623 | 3221334243 | Z653 | 3223431242 |
| Z534 | 3221224434 | Z564 | 3223134212 | Z594 | 3223431233 | Z624 | 3223122312 | Z654 | 3224243122 |
| Z535 | 3221234243 | Z565 | 3221134422 | Z595 | 3213433224 | Z625 | 3221121333 | Z655 | 3223213433 |
| Z536 | 3221123212 | Z566 | 3221321134 | Z596 | 3224231243 | Z626 | 3221331213 | Z656 | 3221244322 |
| Z537 | 3223243134 | Z567 | 3221334322 | Z597 | 3221332312 | Z627 | 3221231342 | Z657 | 3223113312 |
| Z538 | 3213344213 | Z568 | 3221242132 | Z598 | 3223433124 | Z628 | 3223422343 | Z658 | 3213443312 |
| Z539 | 3223211243 | Z569 | 3221321123 | Z599 | 3223324232 | Z629 | 3221324313 | Z659 | 3221131242 |
| Z540 | 3224233122 | Z570 | 3223423433 | Z600 | 3223424322 | Z630 | 3223431344 | Z660 | 3213433442 |
| Z541 | 3223324234 | Z571 | 3223131132 | Z601 | 3221133424 | Z631 | 3221332133 | Z661 | 3221213324 |
| Z542 | 3213343123 | Z572 | 3221134424 | Z602 | 3224213442 | Z632 | 3221131322 | Z662 | 3221124243 |
| Z543 | 3221123134 | Z573 | 3223421243 | Z603 | 3223123324 | Z633 | 3223231122 | Z663 | 3223131312 |
| Z544 | 3223242312 | Z574 | 3223422312 | Z604 | 3223313244 | Z634 | 3224213123 | Z664 | 3213443222 |
| Z545 | 3223431213 | Z575 | 3213422324 | Z605 | 3221323242 | Z635 | 3221132244 | Z665 | 3223244313 |
| Z546 | 3223231343 | Z576 | 3221123124 | Z606 | 3223342242 | Z636 | 3221131244 | Z666 | 3223232443 |
| Z547 | 3221313434 | Z577 | 3221312312 | Z607 | 3221313224 | Z637 | 3221133124 | Z667 | 3223442113 |
| Z548 | 3224234344 | Z578 | 3221344232 | Z608 | 3223124344 | Z638 | 3221233244 | Z668 | 3221124422 |
| Z549 | 3213431312 | Z579 | 3223311243 | Z609 | 3221324322 | Z639 | 3213423313 | Z669 | 3223422443 |
| Z550 | 3221321343 | Z580 | 3223431323 | Z610 | 3221212444 | Z640 | 3221131134 | Z670 | 3213433113 |

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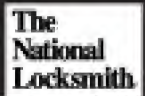


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1994 GM Codes

Z000-Z999

| | | | | | | | | | |
|------|-------------|------|------------|------|-------------|------|------------|------|------------|
| Z671 | 3221321323 | Z737 | 3223293122 | Z803 | 3224231242 | Z869 | 3223131322 | Z935 | 3223433243 |
| Z672 | 3213421333 | Z738 | 3223113322 | Z804 | 3221331233 | Z870 | 3221324244 | Z936 | 3223432434 |
| Z673 | 3223211333 | Z739 | 3221134334 | Z805 | 3213423224 | Z871 | 3213421244 | Z937 | 3224243134 |
| Z674 | 3213431124 | Z740 | 3223224344 | Z806 | 3223442242 | Z872 | 3223343113 | Z938 | 3223311313 |
| Z675 | 3221232133 | Z741 | 3223134423 | Z807 | 3223422132 | Z873 | 3223132443 | Z939 | 3223443122 |
| Z676 | 3221313133 | Z742 | 3223423122 | Z808 | 3224234342 | Z874 | 3224231244 | Z940 | 3223312422 |
| Z677 | 3223213422 | Z743 | 3213442132 | Z809 | 3223224342 | Z875 | 3223113124 | Z941 | 3213423243 |
| Z678 | 3213343423 | Z744 | 3213422434 | Z810 | 3224213233 | Z876 | 3223311242 | Z942 | 3221324213 |
| Z679 | 3223442344 | Z745 | 3223311233 | Z811 | 3221133242 | Z877 | 3224221333 | Z943 | 3213442334 |
| Z680 | 3221324324 | Z746 | 3213442344 | Z812 | 3223131343 | Z878 | 3221321132 | Z944 | 3221343234 |
| Z681 | 3221313323 | Z747 | 3213342343 | Z813 | 3223124434 | Z879 | 3213433424 | Z945 | 3223122444 |
| Z682 | 3221124313 | Z748 | 3213343112 | Z814 | 3223124323 | Z880 | 3213344342 | Z946 | 3223423212 |
| Z683 | 3223443134 | Z749 | 3223312324 | Z815 | 3213434243 | Z881 | 3221124213 | Z947 | 3221121133 |
| Z684 | 3221234423 | Z750 | 3224232313 | Z816 | 3221124244 | Z882 | 3221344242 | Z948 | 3221132324 |
| Z685 | 3213442233 | Z751 | 3223231324 | Z817 | 3223443232 | Z883 | 3224231122 | Z949 | 3224243243 |
| Z686 | 3224223133 | Z752 | 3223132422 | Z818 | 3213424342 | Z884 | 3223311324 | Z950 | 3223123212 |
| Z687 | 3223113344 | Z753 | 3213423124 | Z819 | 3221312324 | Z885 | 3223421133 | Z951 | 3213432244 |
| Z688 | 3221211344 | Z754 | 3224231332 | Z820 | 3221123443 | Z886 | 3221223133 | Z952 | 3221334422 |
| Z689 | 3223432423 | Z755 | 3223212442 | Z821 | 3223124333 | Z887 | 3223213244 | Z953 | 3223133422 |
| Z690 | 3224223433 | Z756 | 3223122344 | Z822 | 3213342324 | Z888 | 3213434324 | Z954 | 3223234422 |
| Z691 | 3223432124 | Z757 | 3213421232 | Z823 | 3223434323 | Z889 | 3221343243 | Z955 | 3223431342 |
| Z692 | 3223123344 | Z758 | 3223224312 | Z824 | 3221232344 | Z890 | 3223443233 | Z956 | 3223443424 |
| Z693 | 3221331122 | Z759 | 3223324212 | Z825 | 3223243112 | Z891 | 3223113232 | Z957 | 3223133213 |
| Z694 | 3221123112 | Z760 | 3221343224 | Z826 | 3221213212 | Z892 | 3213434234 | Z958 | 3221134312 |
| Z695 | 3223134344 | Z761 | 3224231134 | Z827 | 3224234313 | Z893 | 3221124242 | Z959 | 3223442343 |
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| Z698 | 3223321232 | Z764 | 3224213322 | Z830 | 3221331223 | Z896 | 3223342423 | Z962 | 3224231342 |
| Z699 | 3223231134 | Z765 | 3221233122 | Z831 | 3213422133 | Z897 | 3224212442 | Z963 | 3223131224 |
| Z700 | 3224242133 | Z766 | 3223131213 | Z832 | 3223134233 | Z898 | 3221132344 | Z964 | 3223312442 |
| Z701 | 3223442312 | Z767 | 3221244334 | Z833 | 3223213243 | Z899 | 3213342232 | Z965 | 3224242434 |
| Z702 | 3223124342 | Z768 | 3224233112 | Z834 | 3221324323 | Z900 | 3223422334 | Z966 | 3221122444 |
| Z703 | 3223231244 | Z769 | 3221123244 | Z835 | 3223313422 | Z901 | 3213434313 | Z967 | 3223112333 |
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| Z705 | 3213421213 | Z771 | 3223423342 | Z837 | 3223212434 | Z903 | 3223423442 | Z969 | 3224242132 |
| Z706 | 3213424344 | Z772 | 3223442334 | Z838 | 3223432112 | Z904 | 3223133123 | Z970 | 3223244312 |
| Z707 | 3223113234 | Z773 | 3223442424 | Z839 | 3221313313 | Z905 | 3221234234 | Z971 | 3223311213 |
| Z708 | 3221123442 | Z774 | 3221313244 | Z840 | 3221234434 | Z906 | 3221312432 | Z972 | 3223442442 |
| Z709 | 3224243234 | Z775 | 3213431324 | Z841 | 3223134234 | Z907 | 3224231322 | Z973 | 3223113324 |
| Z710 | 3223324312 | Z776 | 3221123243 | Z842 | 3223243423 | Z908 | 3213344324 | Z974 | 3224211243 |
| Z711 | 3223124243 | Z777 | 3224213242 | Z843 | 3213342242 | Z909 | 3221242343 | Z975 | 3221312442 |
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| Z714 | 3221133212 | Z780 | 3223342244 | Z846 | 3223112132 | Z912 | 3223223113 | Z978 | 3224224332 |
| Z715 | 3223423324 | Z781 | 3223433242 | Z847 | 3223312312 | Z913 | 3221322313 | Z979 | 3213443313 |
| Z716 | 3223123112 | Z782 | 3224213132 | Z848 | 3213432122 | Z914 | 3223432343 | Z980 | 3221342132 |
| Z717 | 3221134213 | Z783 | 3213423244 | Z849 | 3213344243 | Z915 | 3221243232 | Z981 | 3223312313 |
| Z718 | 3223433212 | Z784 | 3223324432 | Z850 | 3213442112 | Z916 | 3223212443 | Z982 | 3223431343 |
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| Z720 | 3224243312 | Z786 | 3223421323 | Z852 | 3223432313 | Z918 | 3221332424 | Z984 | 3221373442 |
| Z721 | 3221123113 | Z787 | 3223121312 | Z853 | 3224221132 | Z919 | 3223121132 | Z985 | 3224231124 |
| Z722 | 3221313423 | Z788 | 3221322442 | Z854 | 3223133423 | Z920 | 3224224434 | Z986 | 3221132124 |
| Z723 | 3221342324 | Z789 | 3213423442 | Z855 | 3223443133 | Z921 | 3221123312 | Z987 | 3221313324 |
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| Z727 | 3224243244 | Z793 | 3223443113 | Z859 | 3221213244 | Z925 | 3223442212 | Z991 | 3221313112 |
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| Z729 | 3223442232 | Z795 | 3223322442 | Z861 | 3223224333 | Z927 | 3221234313 | Z993 | 3213342433 |
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| Z731 | 3223342422 | Z797 | 3221321213 | Z863 | 3223113213 | Z929 | 3224212434 | Z995 | 3221311243 |
| Z732 | 3223434423 | Z798 | 3221134232 | Z864 | 3223113212 | Z930 | 3223424334 | Z996 | 3224213244 |
| Z733 | 3221231244 | Z799 | 3223132234 | Z865 | 3221131344 | Z931 | 3223132122 | Z997 | 3223234212 |
| Z734 | 3213431213 | Z800 | 3223312323 | Z866 | 32233131243 | Z932 | 3213432324 | Z998 | 3213434212 |
| Z735 | 3223231312 | Z801 | 3213431222 | Z867 | 3221312424 | Z933 | 3223423423 | Z999 | 3223434222 |
| Z736 | 3224232342 | Z802 | 3221321332 | Z868 | 3221221312 | Z934 | 3224224333 | | |



LOCKSMITHING SCHOOLS

Continued from page 42

basic safe service, Best style locking systems, basic electricity, Commercial locksmithing. Residential available soon.

Length Of Course: Locksmithing Part 1 through 4. Each part is 45 hours.

Notes: Courses taught by factory certified locksmiths holding ALOA-ACE and ALOA-CPL certification.

The Academy Of Locksmithing, Inc.

2220 Midland Ave, Unit 106
Scarborough, Ontario, Canada M1P 3E6

416-321-2220

FAX: 416-321-2219

Resident

Course Descriptions: Basic locksmithing, key identification, door closer installation, codes and code cutting equipment, tubular keys and locks, masterkeying, door hardware installation, aluminum door hardware installation, lockout procedures, high security cylinders, basic electricity, domestic and foreign auto servicing, dial lock servicing and lockout procedures, and manipulation.

Length Of Course: Day and week long courses offered throughout year. See schedule.

Notes: Registered with the Ministry of Universities and Colleges (Canada).

Universal School Of Master Locksmithing

3201 Fulton Ave.
Sacramento, CA 95821
916-482-4216

FAX: 916-485-9385

Resident and correspondence
Course Descriptions: Basic locksmithing. Commercial and residential.

Length Of Course: Correspondence includes 32 lessons. Resident includes 120 hours of shop training.

Notes: State of California approved.

Valley Technical Institute

5408 N. Blackstone Ave.
Fresno, CA 93710

209-436-8501

FAX: 209-439-3814

Resident only

Course Descriptions: Basic Locksmithing includes lever/warded/safes, disc/wafer, pin tumbler/high security/masterkeying and automotive locks. Impressioning,

picking, key identification. Residential and commercial.

Length Of Course: 16 Weeks



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SHOP TALK

Helpful questions and answers

Shop Talk answers readers questions on any locksmith related topic. Only letters judged to be of general interest will be published. We regret that we cannot answer individual letters. Because of the volume of mail, only those questions answered in the magazine will receive answers. Send your questions to Shop Talk, *The National Locksmith*, 1533 Burgundy Parkway, Streamwood, IL 60107.

Q: What's the secret to making a key for the old Champion 6-Lever padlock? I know that the blank is the Ilico T131 and it fits fine, but now what is the best way to generate a key?

Bill Hampson
British Columbia

A: To quote from *The National Locksmith's Guide To: Antique Padlocks* by Jack Roberts, "This padlock was made by the millions by virtually every lock company that was in business around the turn of the century."

As a result, both dating the lock and determining the



Illustration 1

manufacturer are very difficult, although the number and location of the case rivets and the location of a chain loop (if any) will help. These locks were made with three, four and six lever mechanisms. (See illustration 1.)

There are a couple of

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methods for generating a key for this lock. One of the most common methods, according to Bob Sieveking, is to pick open and impression. Once the lock is opened, the shackle holds the levers in place, making the impressing possible. This can be a long and tedious process, however.

As an alternative, Jack's book (page 69) describes the construction and use of a copy jig. Once the lock has been picked, the jig, comprised of an alligator clip and several pieces of round spring steel rods, is placed into the lock and onto the top of the levers to create a profile of the levers. Cutting a key per the profile creates a working key.

The final alternative involves dismantling the lock. According to Bob Sieveking, technical writer for *The National Locksmith*, the case rivets on these locks were made of a very soft brass, making it easy to gently pry the lock case halves apart. With the lock case dismantled, make your key from the exposed levers and replace the casings.

Q : I need to know where to get locksets with 2" backsets.
*Harvey Barlow,
North Carolina.*

A : We published this very same information about a year ago, Harvey, but the need for a 2" backset seems to have made a resurgence this month. Apparently there are a lot of the old 2" backset locksets and deadbolts still out there.

The product you referred to in your letter was initially manufactured and sold by Amerock and was later bought by National Lock Co. According to National, the locks in question can be purchased at Laza & Company, 504 N. Central Expressway, Richardson, TX 75080, 214-231-3371.

According to Laza & Company this lockset can be purchased as a knob/deadbolt package or each can be purchased separately and are available in bright or antique brass.

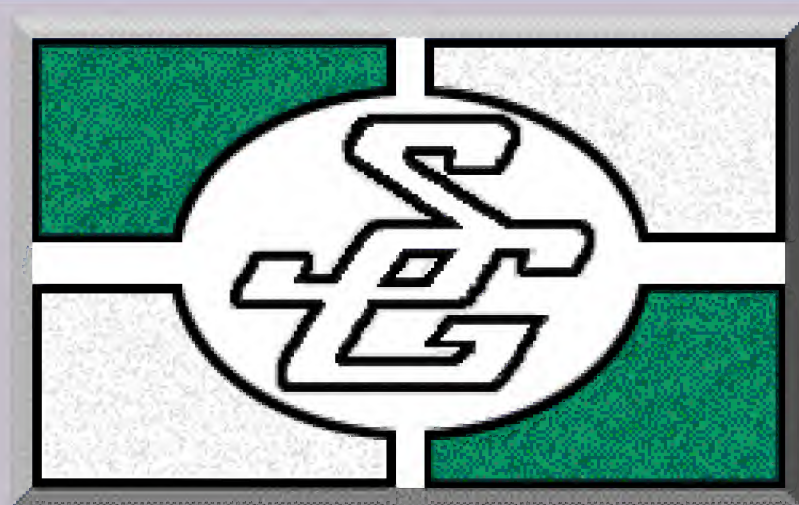
Approximate costs at the time of this article are:

| PRODUCT | PART # | FINISH | COST |
|--------------------|-----------|---------------|---------|
| Lever/Single Ddblt | 2310F-3 | Bright Brass | \$62.99 |
| Lever/Dbl. Ddblt | 2310FD-3 | Bright Brass | \$71.78 |
| Lever | 2310B-3 | Bright Brass | \$41.03 |
| Single Ddblt | 2310AF-3 | Bright Brass | \$31.03 |
| Dbl. Ddblt | 2310AFD-3 | Bright Brass | \$40.67 |
| Lever/Single Ddblt | 2310F-4A | Antique Brass | \$60.74 |
| Lever/Dbl. Ddblt | 2310FD-4A | Antique Brass | \$69.55 |
| Lever | 2310B-4A | Antique Brass | \$34.97 |

These units currently use a universal keyway, allowing for keying to Dexter, Weiser, Kwikset, Weslock and similar keyways.

It should also be noted that Lori carries a modified deadbolt housing and bolt unit for converting their standard deadbolt to a 2" backset. These two parts cost approximately \$15 and are added to the cost of the deadbolt.

Because the face of the 2" bolt unit requires a narrow faceplate, I recommended buying the Lori 2-3/8" deadbolt that uses the narrow faceplate.



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TEST DRIVE



*Taking Industry
Products for a Spin
Around the Block*

DAREX M5 DOUBLE DELUXE

PRODUCT: The Darex M5 Double Deluxe (two Borazon grinding wheels) available from the Darex Corp., 220 Hersey St., P.O. Box 277, Ashland, OR 97520, 800-547-0222. Price is \$1048.

PRODUCT DESCRIPTION: The M5 Double Deluxe is a precision drill bit grinding unit that includes two Borazon grinding wheels, two chucks to handle drills from 1/16" to 3/4", point splitting/web thinning attachment, diamond wheel dresser, light, stand and instructional video. The optional #4500 sheet metal and wood point attachment (\$89) was included for this review.

The standard M5 includes all of the above except for the Borazon wheels. Standard M5 grinding wheels are aluminum oxide. Cost of the M5 is \$898. Other models include the M4 at \$498, and the M3 at \$249. The M3 drill sharpener attaches to your existing bench grinder.

FRIENDLINESS: While time and practice are necessary to learn and refine sharpening skills, a thorough reading of the clear and easy to read manual make this machine no harder to operate than a key machine. A short instructional video, included, adds to the ease of learning.

FEATURES: To sharpen standard drill bits, simply insert the bit into the correct chuck and insert into the alignment fixture attached to the top of the grinder unit. The alignment fixture is used to correctly register the



1. The Darex M5 drill sharpener at work.



2. This refurbished Black & Decker Bullet Pilot Point™ bit was pulled out of an old drill bit scrap heap and resharpened to a better than original point

bit in the chuck to obtain the chosen and desired angle. Once set, the chuck and bit are placed in the sharpening fixture and sharpening begins.

One of the nice features of this sharpener is its versatility. Locksmiths have a varying degree of materials that they drill; e.g. aluminum, plastic, steel, masonry, hardened steel, hardplate, etc. The Darex sharpener allows the locksmith to resharpen or modify existing points to meet the characteristics of the material being drilled. Both the lip relief angle (rake), and the point angle can be adjusted. This type of controlled sharpening is excellent when resharpening almost any type of drill including safe drills.

Using the point splitting/web thinning fixture allows for creating fast cutting specialty points. Additional fixtures, such as the #4500 allows for specialty sharpening of sheet metal and wood point drills. For this review, a Black & Decker Bullet Pilot-Point™ bit was resharpened and worked as well if not better than the original.

COMMENTS AND SUGGESTIONS: If any changes are recommended it's to simply make provisions for pivoting the plastic eye shields. Once attached, the mounting screws have to be loosened before moving or pivoting the shield. This is sometimes a nuisance while in the middle of sharpening a point.

CONCLUSION: The M5 is an excellent specialty tool, that was not only easy to use, but sharpens as advertised.

DESCRIPTION:

Drill bit sharpener.

COMMENTS:

Easy to use.

Versatile.

TEST DRIVE RESULTS:

The M5 effectively sharpens standard and specialty drill bits. Create drill points to serve the cutting needs of the user. The savings in resharpening a bit quickly offsets the purchase price of the equipment.

